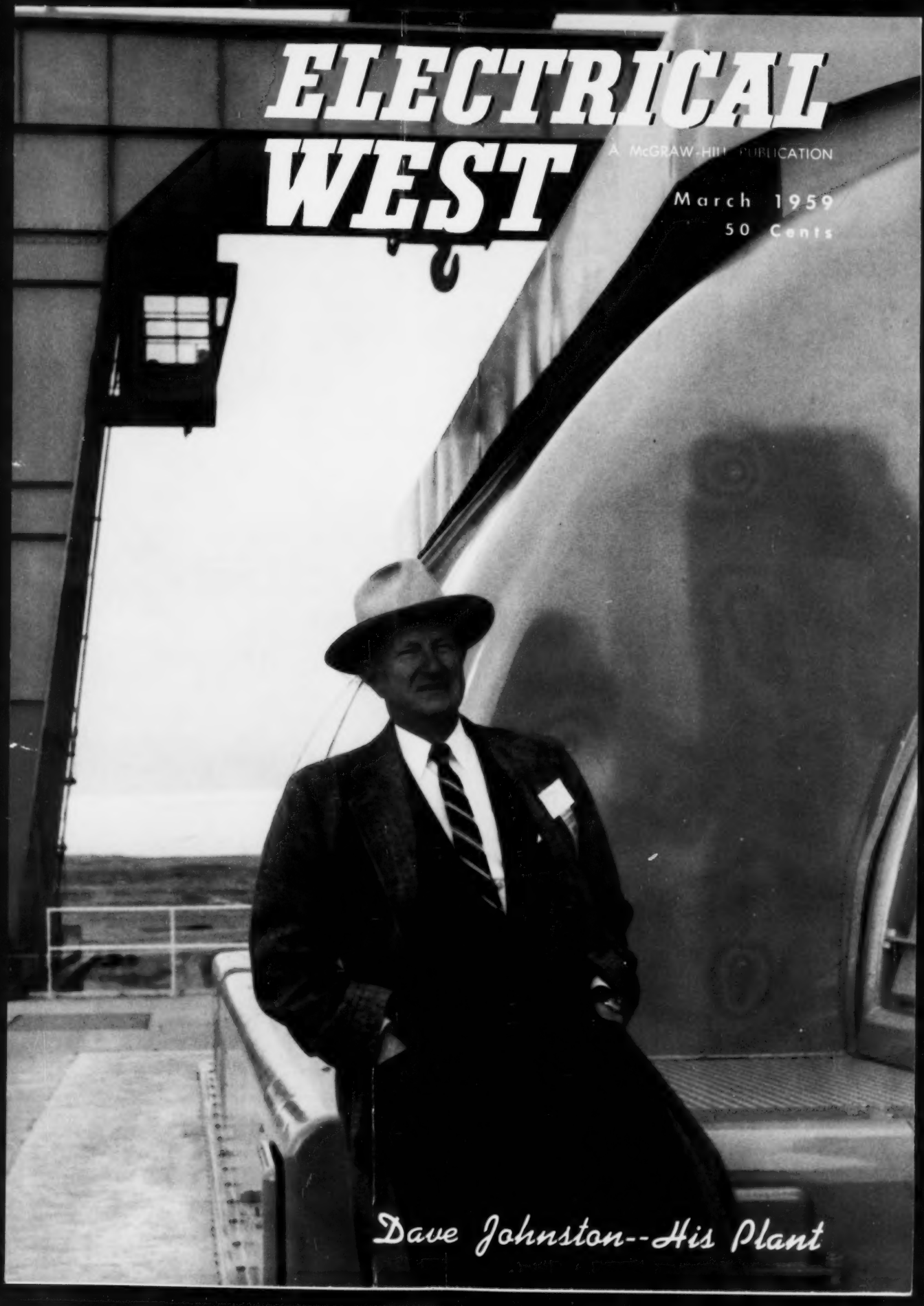
ELECTRICAL WEST

A McGRAW-HILL PUBLICATION

March 1959

50 Cents



Dave Johnston--His Plant

VERSATILE

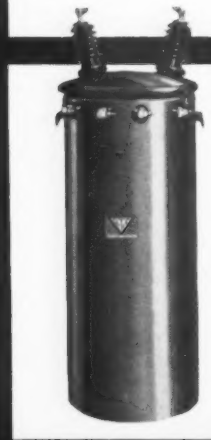
RT&E

Designs distribution transformers in standard and special styles to meet all requirements

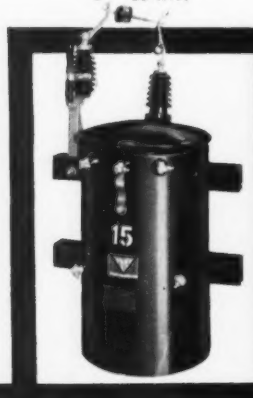
Conventional
2400 V. — 25 KVA
Typical Construction
4800 V. and below
5 — 25 KVA

Completely Self Protected
7200 V. — 15 KVA
Typical Construction
7200 V. thru 14,400 V.
5 — 25 KVA

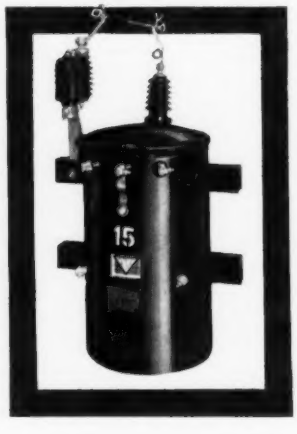
Duplex
7200 V. — 10/15 KVA
Typical Construction
7200 V. — 7620 V.



Protected with Double Gap and Loadguard
7200 V. — 15 KVA
Typical Construction
7200 — 14,400 V.
3 — 25 KVA

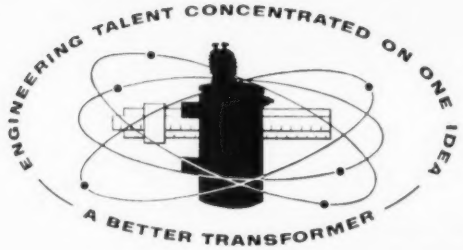


Protected with Arrester and Loadguard
7200 V. — 15 KVA
Typical Construction
7200 V. — 14,400 V.
3 — 25 KVA



Dual Voltage
2400 V. x 7200 V. — 10 KVA
Typical Construction
Combinations thru 14,400 V.
5 — 25 KVA

Conventional
7200 V. — 100 KVA
Typical Construction
7200 V. — 14,400 V.
75 — 100 KVA



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editorial views EW

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Quality Approach — Steps are being taken in southern California to bring the fluorescent fixture manufacturers together in an association that would "sell up" to quality products and lighting. This action comes at a propitious time. Fluorescent fixtures run the gamut from being merely a holder and reflector for tubular light sources to highly engineered products that provide quality lighting and trouble-free performance over a long period of time. Within these wide limits, fixtures all too often have kept competitive pencils sharp.

The industry is entering a new era in lighting standards and lighting performance. **Now, as never before, the time is here when more lumens, high quality of light and good system engineering must be sold.** If the fledgling association can reverse the trend and "sell up" on lighting, it may point the way for other segments of the industry to stress customer satisfaction over price. That's a philosophy well worth spreading.

—EW—

Creative Achievement — Speaking of philosophy, the Los Angeles Chamber of Commerce did the unusual by making its annual award for creative achievement to a company rather than an individual. More important, it was a company within our own industry—General Electric—which was cited for the honor because "it accepted the responsibility, as a company obligation, to participate in the field of public affairs in furtherance of community betterment and economic freedom."

The featured speaker at the chamber's annual dinner was G-E's president, Robert Paxton, who outlined the importance of the business climate to industry and the individual citizen, and suggested ways and means of halting the vast changes that are eroding the very foundations of our free society. The real key to Mr. Paxton's remarks lay in his statement that every businessman and every managerial employee at all levels must work unceasingly to improve the local business climate. This is a responsibility that transcends mere competence in business management. **It means that businessmen must speak out on current political issues vital to business and the public interest; that the businessman must communicate through all media to all employees, shareholders, customers, other businessmen and community neighbors.**

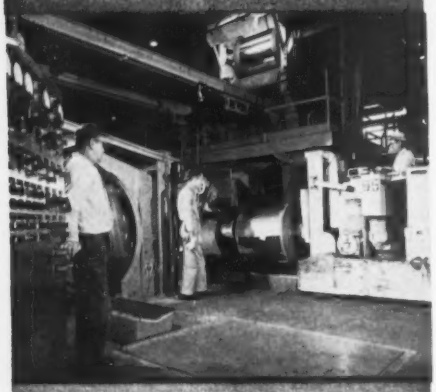
The recognition given G-E for its efforts toward improving the business climate is evidence enough that such efforts can get results. In congratulating the General Electric organization for the award, the industry might well note that it has thousands of supervisory and management people with the talent to help create a good business climate in their own communities.

—EW—

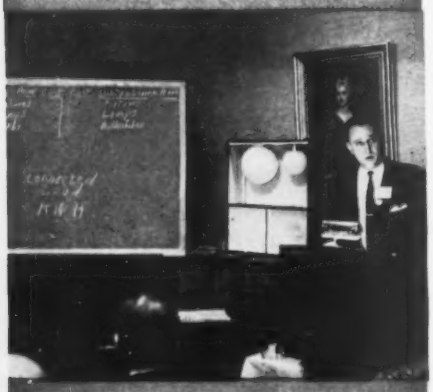
Appropriate Quotation — Now that the controversy over the use of water between northern and southern California is reaching crucial stages, it seems somewhat prophetic that the Bible offers good advice to both factions. How more appropriately could it be said than this verse from Isaiah, Chap. 43, Verse 6: **"I will say to the north, Give up; and to the south, Keep not back: bring my sons from far, and my daughters from the ends of the earth."**

The 1958 Sales Record 61

New Industry to Wyoming 66



1,250 Ft Per Minute 77



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ELECTRICAL WEST

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U.S. Established 1887

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The Cover—Dave Johnston, by acclamation dean of utility executives in the Rocky Mountain area, stands near the first 100,000-kw unit of Pacific Power & Light's new Wyoming steam plant named in his honor. Photo by Electrical West's Jack Robinson. See p 66.

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UTILITIES EXPECT MORE FROM

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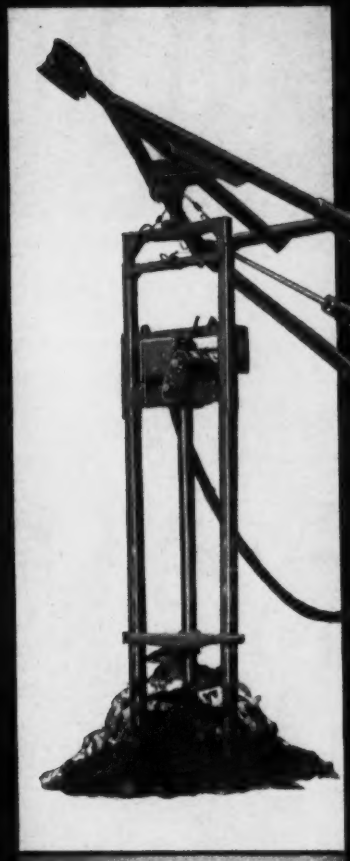
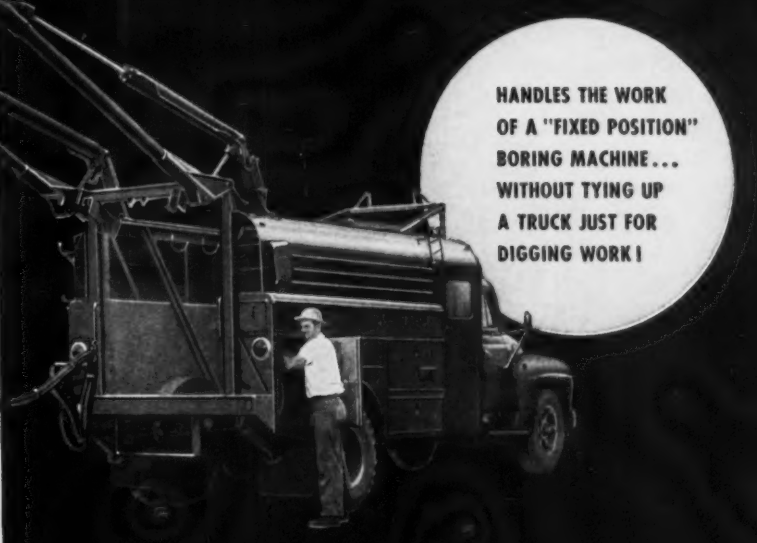
ALL-NEW
Series EM-2
"Earth-Master"
HYDRAULIC HOLE DIGGER

THE ONLY PORTABLE DIGGER THAT DOES THE COMPLETE JOB





HANDLES THE WORK OF A "FIXED POSITION" BORING MACHINE... WITHOUT TYING UP A TRUCK JUST FOR DIGGING WORK!

Here at last . . . a portable digger that digs holes from 9" to 30" in diameter—up to 10'6" deep, vertically or at various angles.

The EM-2, powered by a hydraulic pump utilizing the full torque of the truck engine, is designed for use with a "live boom" derrick such as the Series PM-2 "Pole-Master" Hydraulic Derrick shown in photos.

The unique digging head, providing low speed for digging and high speed for "spin off," is powered by a reversible hydraulic motor; also fed and raised by hydraulic power. It is rigidly guided at all times to assure straight, clean holes consistently—whether the soil is hard or soft, wet or dry.

When not in use the digger does not interfere with operation of the derrick. It can be stowed in special brackets on the derrick or can be easily removed for use on another vehicle.

Why not take a minute right now to send for complete details?

SERIES EM-1 . . . a smaller version of the EM-2 . . . digs holes to 9'4" deep, from 9" to 20" in diameter.

SERIES DF-1 . . . has auger with Pengo head —in size for digging holes from 9" to 20" in diameter, up to 10' deep.

Save time and money . . . let our sales and engineering staff analyze all your truck body and equipment needs.

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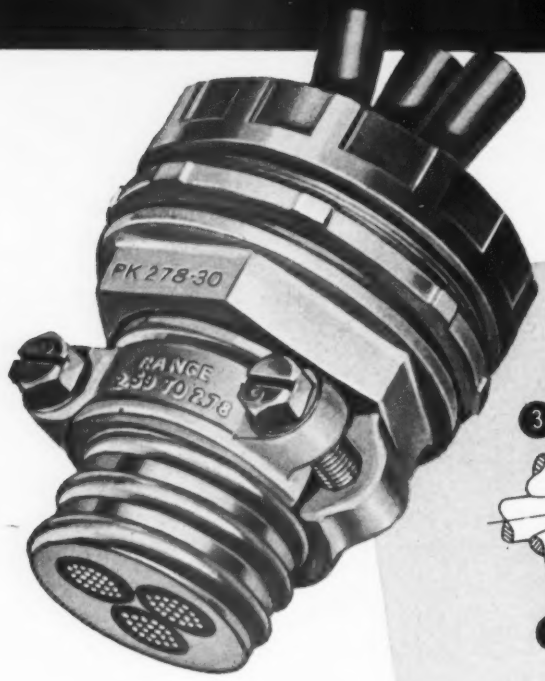
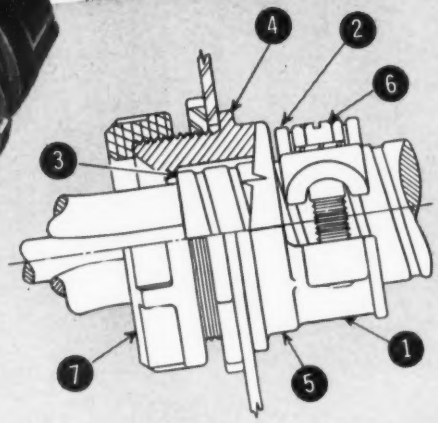
5525 S. E. 28TH AVE.
PORTLAND 2, ORE.

5900 NO. BROADWAY
ST. LOUIS 15, MO.

from every angle–

O.Z. TYPE "PK" is the clamp





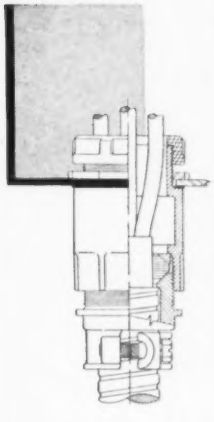
1. Special Aluminum Alloy body and clamping cap for strength and corrosion resistance.
2. Armor clamped several turns from end.
3. Smooth armor stop assures termination at proper point—protects cable insulation from sharp, rough edges.
4. Flange on body eliminates locknut outside of cabinet.
5. Large hex facilitates installation.
6. Slotted hex-head clamping bolts can be tightened by wrench or screwdriver.
7. Strong O.Z. Type A hi-impact phenolic insulating bushing.

Here is a clamp designed specifically to meet the requirements of interlocked armor cable applications. The O. Z. Type "PK" Clamp provides exceptional speed and ease of installation, whether your cable enters the cabinet from the top, bottom or side. It is available for interlocked armor cable ranging in size from .45" to 4.28" O. D.

for ARMORED CABLE

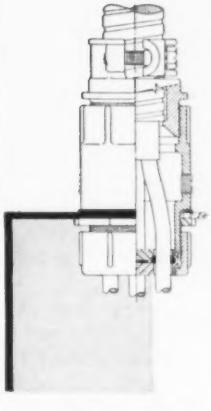
combines with standard O.Z. fittings for any terminating or splicing job involving INTERLOCKED ARMOR CABLE.

Seals cable ends to protect insulation against moisture and other contaminators—can also be used with threaded hubs and bosses to provide watertight cable entrances.



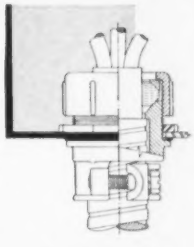
TYPE "PKC"

Compound type terminator for interlocked armor cable entering bottom of cabinet.



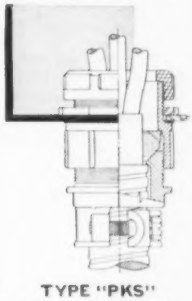
TYPE "PKT"

Compound type terminator for interlocked armor cable entering top of cabinet.



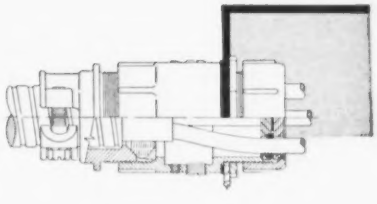
TYPE "PKG"

Sealing gland type terminator for interlocked armor cable entering a cabinet.



TYPE "PKS"

Provides watertight cable entrance seal in any position. Can also be used as a compound fitting in upright position.



TYPE "PKH"

Compound type terminator for interlocked armor cable entering side of cabinet.

TYPE "PKJ"

Splicing fitting for interlocked armor cable.

For complete information on these and other O. Z. Fittings for use with Interlocked Armor Cable, write for Engineering Bulletin 135A.

O.Z. ELECTRICAL MANUFACTURING CO., INC.

262 BOND STREET • BROOKLYN 17, N. Y.

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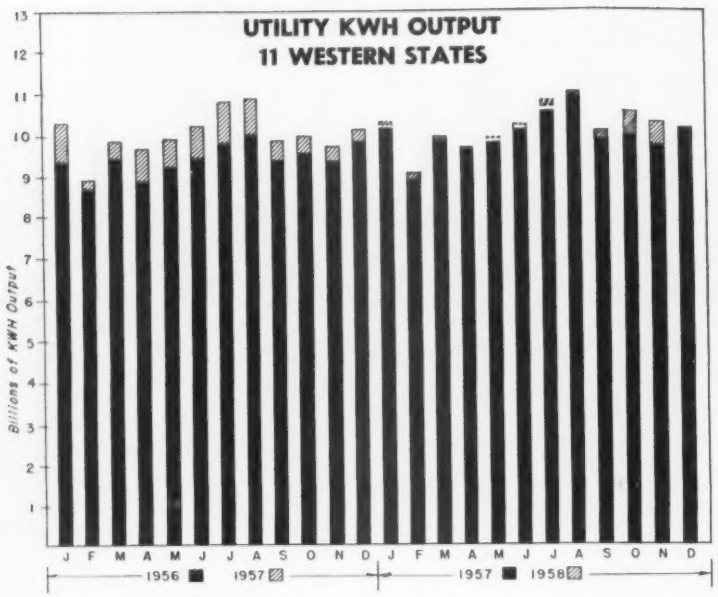
- CAST IRON BOXES
- CABLE TERMINATORS
- POWER CONNECTORS
- SOLDERLESS CONNECTORS
- GROUNDING DEVICES
- CONDUIT FITTINGS
- INTERLOCKED ARMOR CABLE FITTINGS

----How're We Doing?



Output Comparisons

Year-to-year Kwh Output Changes in Western Regions and U. S.
Per Cent Changes Over Same Week One Year Ago

Week Ending	Rocky Mountain	Pacific Southwest	Pacific Northwest	U. S. Total
Jan. 3	+ 6.3	+ 8.6	+ 3.4	+ 5.7
Jan. 10	+ 9.0	+ 8.0	+10.6	+ 8.4
Jan. 17	+ 6.6	+ 6.6	+ 8.4	+ 7.5
Jan. 24	+ 8.2	+ 6.3	+ 7.4	+ 8.0

Record

Peak electric power load for the U. S. in 1958 reached an all-time high of 113.5 million kw in December. EEI figures show that this peak was 6%, about 6½ million kw, higher than the 1957 December peak and was 4% higher than the 1958 summer peak. Also of interest is the statement that the average annual increase in generating capability is 10.1%—equivalent to doubling every seven years.

Outlook

Machinery orders in 1959 are expected to top all previous years. Capital goods manufacturers anticipate a 21% gain in bookings over 1958 . . . Housing starts in January were at an annual seasonally adjusted rate of 1,350,000 but some observers predict that the 1959 total will probably be about 1,200,000 . . . Scare buying has pushed steel orders 'way up in anticipation of possible summer strike . . . High stock prices make equity financing look better to utility financial men . . . And foreign competition is making its strongest bid yet for Western publicly owned power installations.

Earnings — Net income of Westinghouse Electric Corp. in 1958 was $74,772,000, equal to $4.25 a common share, compared with $4.18 in 1957, although net sales billed were down 5.6% from the previous year. . . Cornell-Dubilier reported net income from 1958 was $118,686, 28¢ per share on common as compared with $754,928 or $1.38 per share in 1957. . . 1958 net income of Youngstown Sheet & Tube was $21,501,320, $6.23 per share, compared with $42,508,579 and $12.35 for 1957. . . Thomas Industries estimates its 1958 sales at $20,300,000 in contrast to $20,000,000 in 1957. Increase in civilian sales was more than $1,000,000 the company reports.

Construction Highlights

Lakefront project, hotel and apartments, Yarrow Bay, Houghton, Wash., $7,000,000.

Federal office, Salt Lake City, Utah, $10,800,000.

Petrochemical plant, Wilmington, Calif., $7,000,000.

Housing, Glasgow Air Force Base, Glasgow, Mont., $7,500,000; at Beale Air Force Base, Marysville, Calif., $6,600,000.

Research building, University of Denver, Denver, Colo., $4,000,000.

Home subdivisions, 600 units, Mountain View, Calif., $7,000,000; Fremont, Calif., 1,150 units, $15,000,000.

Institute of Technology and Engineering, first stage of development, La Jolla, Calif., $15,000,000.

Junior college, Los Altos, Calif., $10,000,000.

Uranium processing plant, Riverton, Wyo., $3,300,000.

General Electric plant addition, Phoenix, Ariz., $1,500,000.

American National Bank, Cheyenne, Wyo., $1,500,000.

Hospital additions and new construction: Littleton, Colo., $4,000,000; Fort Logan, $3,500,000; Los Angeles, Calif., $6,500,000; Hayward, $4,000,000; Livermore, $1,000,000; San Francisco, $970,000; Las Cruces, N. M., $1,500,000; Denver, Colo., $3,000,000; Martinez, Calif., $9,700,000.

Fifteen-story apartment, San Francisco, Calif., $5,000,000; at Sunnyvale, 120-unit, $3,000,000; at Denver, Colo., $3,500,000.

Fire brick plant, Herald, Calif., $2,000,000.

Brewery, Tumwater, Wash., $1,700,000.

Hotels: Oakland, Calif., $7,000,000; Santa Cruz, $3,000,000; Palm Springs, $4,500,000; Pueblo, Colo., $1,600,000; Anchorage, Alaska, $5,500,000.

Office building, Salt Lake City, Utah, $3,000,000.

Research laboratory, Littleton, Colo., $2,500,000.

Rest home, 200-unit, Kirkland, Wash., $2,000,000.

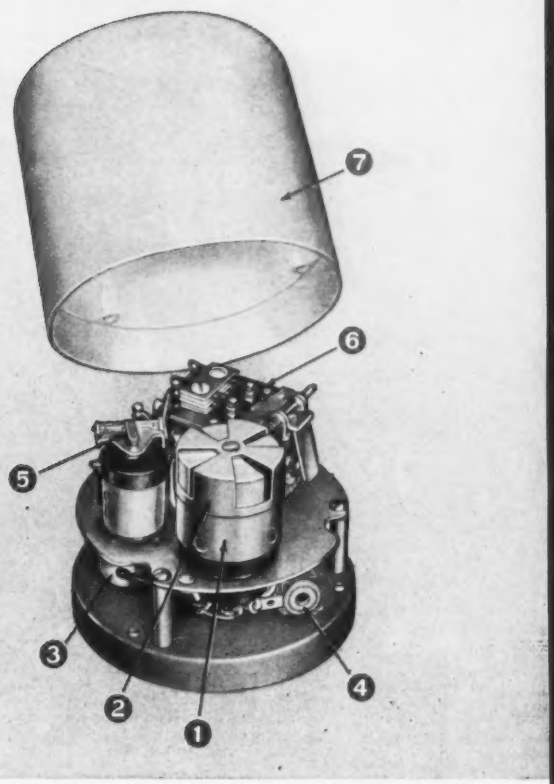
Recreation center, Rocklin, Calif., $3,000,000.

Greyhound bus depot, Fresno, Calif., $1,000,000.

Forestry building, Utah State University of Applied Sciences, Logan, Utah, $2,250,000.

Warehouse and office, Los Angeles, Calif., $1,250,000.

L-M'S NEW cadmium-sulphide photoelectric control fits standard EEI-NEMA heads with Twist Lock® receptacle or adapter available for straight prong sockets. Reliable research reports indicate that hermetically sealed cell assures long life—with contact life of 15 years or more. Factory setting 1 to 1½ footcandles; adjustable from ½ to 6 footcandles.



COMPONENT PARTS: (1) cadmium-sulphide photocell with broad active surface; (2) adjustable louver; (3) capacitor; (4) selenium rectifier—improves pilot relay action; (5) pilot relay, d-c type; (6) load relay with non-integrating time delay; (7) Tenite® II plastic housing, 4 x 4 inches. Other components, not visible, are resistor; lightning arrester, 3-prong locking-type plug—holds control firmly on head.

New L-M Tubeless Cadmium-Sulphide Photo Control—Dependable, Economical

Conservative operation of all components, and even light distribution over photocell's active surface, provide maximum life, trouble-free service.

L-M announces a new tubeless photoelectric control for incandescent, fluorescent, and mercury vapor outdoor lighting. The new unit, built by Tabet, achieves long life and reliable, economical operation by effective use of a new cadmium-sulphide photocell connected directly to a d-c pilot relay. The cell provides enough current to operate the relay with as little as one-half footcandle, without amplifying tubes or transistors.

The photoconductive-type photocell has a broad active surface and is hermetically sealed for stability. A unique adjustable louver spreads the light evenly over the entire active surface of the cell to insure long unit life. The plastic housing provides additional diffusion. The result is a control that is so economical, and requires so little maintenance, that it is practical to use a control on each luminaire.

Built-in Time Delay

The new Cd-S control uses magnetic pilot and load relays. The load relay provides positive non-integrating 5-second time delay, which eliminates transient operation by lightning flashes or traffic. Contacts are rated 1000 watts. The pilot relay is a time-proved d-c type which operates on low current.

Get Details From L-M

Ask the L-M field engineer or lighting engineer for more information on the many advantages of these new L-M cadmium-sulphide photoelectric controls. Or write for bulletin to Line Material Industries, Lighting Division, Milwaukee 1, Wisconsin. In Canada: Canadian Line Materials, Ltd., Toronto 13, Ontario.

LINE MATERIAL Industries Outdoor Lighting

McGRAW-EDISON COMPANY

DISTRIBUTION TRANSFORMERS • KYLE RECLOSERS AND OIL SWITCHES • FUSE CUTOUTS AND FUSE LINKS • LIGHTNING ARRESTERS
POWER SWITCHING EQUIPMENT • PACKAGED SUBSTATIONS • CAPACITORS • REGULATORS • OUTDOOR LIGHTING
LINE CONSTRUCTION MATERIALS • PORCELAIN INSULATORS • FIBRE PIPE AND CONDUIT

A NEW WRINKLE IN NETWORK DESIGN

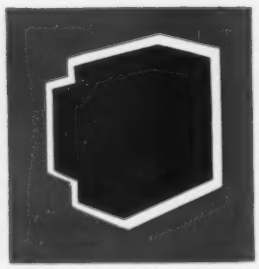
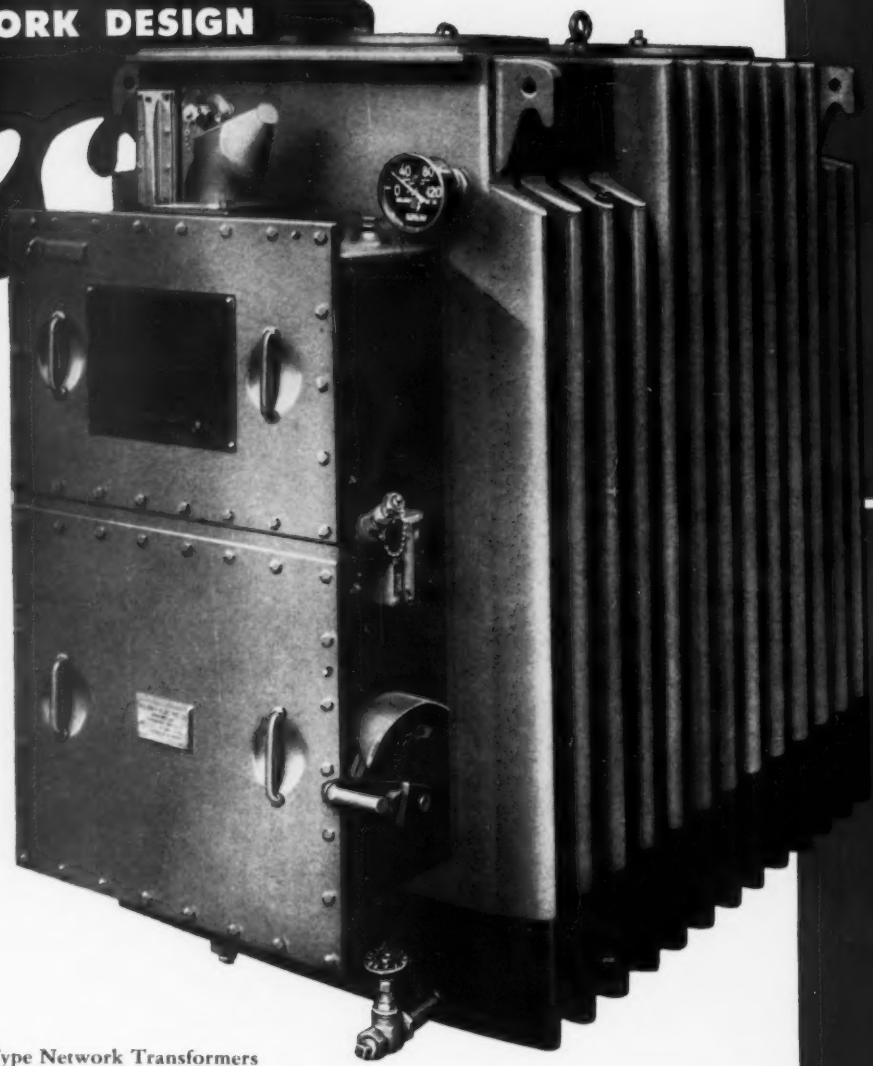


Diagram illustrates savings in space of new design as compared with older type network transformer.



Moloney Subway or Vault-Type Network Transformers with corrugated tanks are strong, rugged units developed by Moloney to answer some of the problems associated with the use of network transformers.

These units are built to conform to the EEI-NEMA Standards for Network Transformers or to conform to customers specifications.

Moloney Network Transformers offer your system the performance, dependability and trouble-free service expected of all Moloney products . . .
Specify Moloney Transformers for Quality . . . All Along The Line.

MEB8-13

MOLONEY ELECTRIC COMPANY

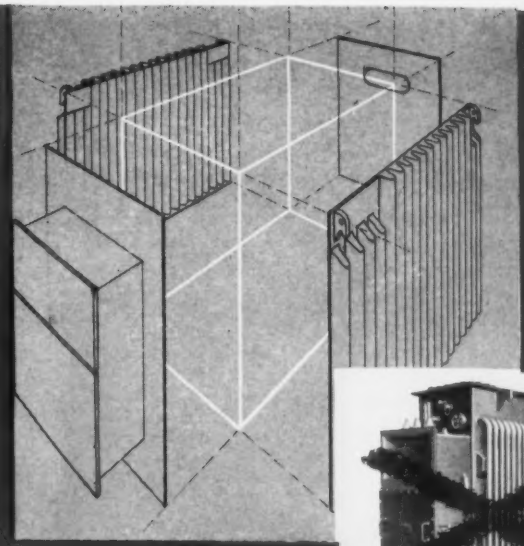
Manufacturers of Transformers for Utilities, Industry, and Electronic Applications

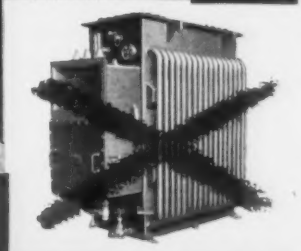
SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES AT ST. LOUIS 20, MO. AND TORONTO, ONT., CANADA

REAL TANK CORRUGATIONS

Moloney Network Transformer tank walls are really corrugated (as shown in diagram) and are welded only at the corners.

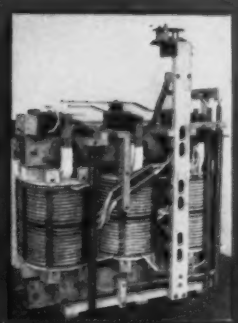
The old problems of corrosion spots and servicing accessibility are gone; now inspection, cleaning and painting is easily done from above.





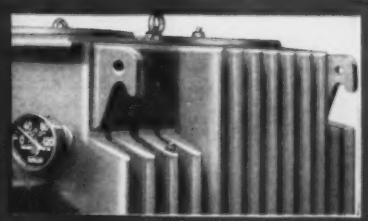
RUGGED CORE-AND-COIL UNIT

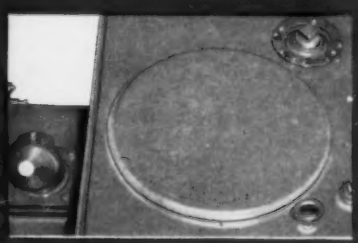
The core-and-coil assembly is a rugged, compact unit solidly blocked and framed. Every lead is adequately insulated and rigidly braced. All bus bars are supported by stand-off insulators. The core-and-coil unit is securely fastened into its position in the tank by adjustable clamps.



INCREASED MECHANICAL STRENGTH

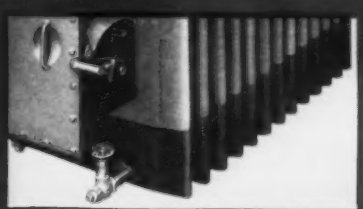
Moloney's ability to corrugate the steel plates of the transformer tank wall produces a tank of inherently greater mechanical strength, thereby eliminating the need for cross bracing.





SEALED AGAINST MOISTURE

[illegible] absolutely sealing the tank against the entrance of moisture.



UNDERCOATING OF TANK BASE AND LOWER TANK WALLS

[illegible] obtained by the application of protective undercoating extending up the tank walls to a point above the normal level of submersion.

EW news roundup

COMER—The development of electric automobiles is being done with a determination that usually precedes success.

Electric utility interest is understandable since the nighttime battery recharging load would be most welcome, and also because the little runabouts might prove to be very useful in utility operations.

Last month we mentioned the work being done on conversion of a Crosley sedan by Washington Water Power's Bob Sewell. Since then, Stinson Aircraft Tool & Engine Co. has started production on the first 500 Charles Town-Abouts, 100 of which have been ordered by utility companies. Utilities will also own the first 50 to 100 Cleveland Vehicle Co.'s CV trucks, developed in conjunction with Electric Storage Battery Co.

Proving grounds tests will begin in June on a converted Rambler American, made by American Motors and several other "partners."

Another Westerner, Anthony J. Morroni, general manager of Electric Equipment & Engineering Co., Denver, has converted a 1955 Chevrolet, and is designing a complete control system as well as beginning battery research.

Morroni designed the famous Pikes Peak cog railway, and some diesel units.

Anthony Morroni, president of Electric Equipment and Engineering Co., with electric car

—EW—

URANIUM REPORT—Atomic Energy Commission's Jesse C. Johnson told the National Western Mining Conference in Denver, Colo., that uranium ore mined in the Western states last year totaled 5 million tons, out of which about 12,500 tons of uranium oxide concentrate were produced. The value of the concentrate was $238 million, far above the value of the newly mined domestic lead and zinc ores of the country.

Domestic uranium production through 1966 probably will average about 18,000 tons of uranium oxide per year, having a value of more than $300 million.

Ore reserves which stood at 30 million tons at the beginning of 1956 are now in excess of 80 million tons, largely as the result of aggressive prospecting and ore body development. Johnson stated that the knowledge and experience gained in exploring for uranium indicates that undiscovered uranium resources of this country are far greater than those already developed.

—EW—

TRANSFORMER GIANT—A Belgian electrical manufacturer is shipping a 600,000-kva transformer bank for installation in Sweden's Vargfors underground power station 40 miles from the Arctic Circle. The installation will comprise four shell-type transformers (one for a spare), each having a rating of 220,000 kva with 400,000/150,000/13,700-v windings. The transformers will raise the 13.7-kv generator voltage to the Swedish grid voltage of 400 kv and also connect to another 150-kv grid.

Ole Svenson, our favorite line construction foreman, was overheard telling an apprentice lineman:

"Now yust remember. If you don't have one foot on the ground, keep one hand on the pole until you get your safety belt hooked."

—EW—

ISOTOPE GENERATOR—Electricity was directly produced from a radioisotope-thermionic converter combination at the Vallecitos Laboratory of the General Electric atomic power equipment department last month. In an eight-day experiment, a radioisotope of gold (in the form of a small strip 1/16th of an inch thick, 4 in. wide and 6 in. long) was used in conjunction with a thermionic converter employing two small discs about the size of half dollars from which electrons are "boiled" off a hot metal surface to produce

Both initial and periodic tree trimming are cut to an absolute minimum with Rome's preassembled aerial cable.

Fast, efficient installations, even in densely wooded areas, are possible with Rome's preassembled aerial cable.

Trim your tree-trimming costs with Rome's preassembled aerial cable

Stringing power lines, especially through wooded areas, need not be a time-consuming, expensive installation. Not if you use Rome's preassembled aerial cable.

Because of the staunch characteristics of preassembled aerial cable, both initial and periodical tree-trimming time is cut way down. Initially, you need not clear as much of a right of way for preassembled aerial cable as is necessary in the case of open-wire construction. Periodic tree trimming can be put off for as long as five years, in some cases. This is compared to a normal two-year requirement for open-wire construction.

In residential areas, tree trimming can be a problem. Home owners, who have an inherent interest in the trimming of trees which grace their property, are very interested in the amount of trimming that is necessary. When using Rome's preassembled aerial cable, it is not necessary to disturb the trees as much as in the case of open-wire installations.

In addition to the tree-trimming advantages of Rome's preassembled aerial cable, there are many other "reliability" factors which you get by specifying this particular type of cable installation.

Improved Voltage Regulation

Aerial cable, because of its close geometric spacing as compared with open-wire circuits, has a lower reactance. Voltage drop is about half as great as typical crossarm construction. Similarly, for a given allowable voltage drop, power can be transmitted twice as far.

Storm Protection

You can reduce your storm maintenance costs due to the strength of preassembled aerial cable. Falling branches, or even trees, can be supported by the cable itself.

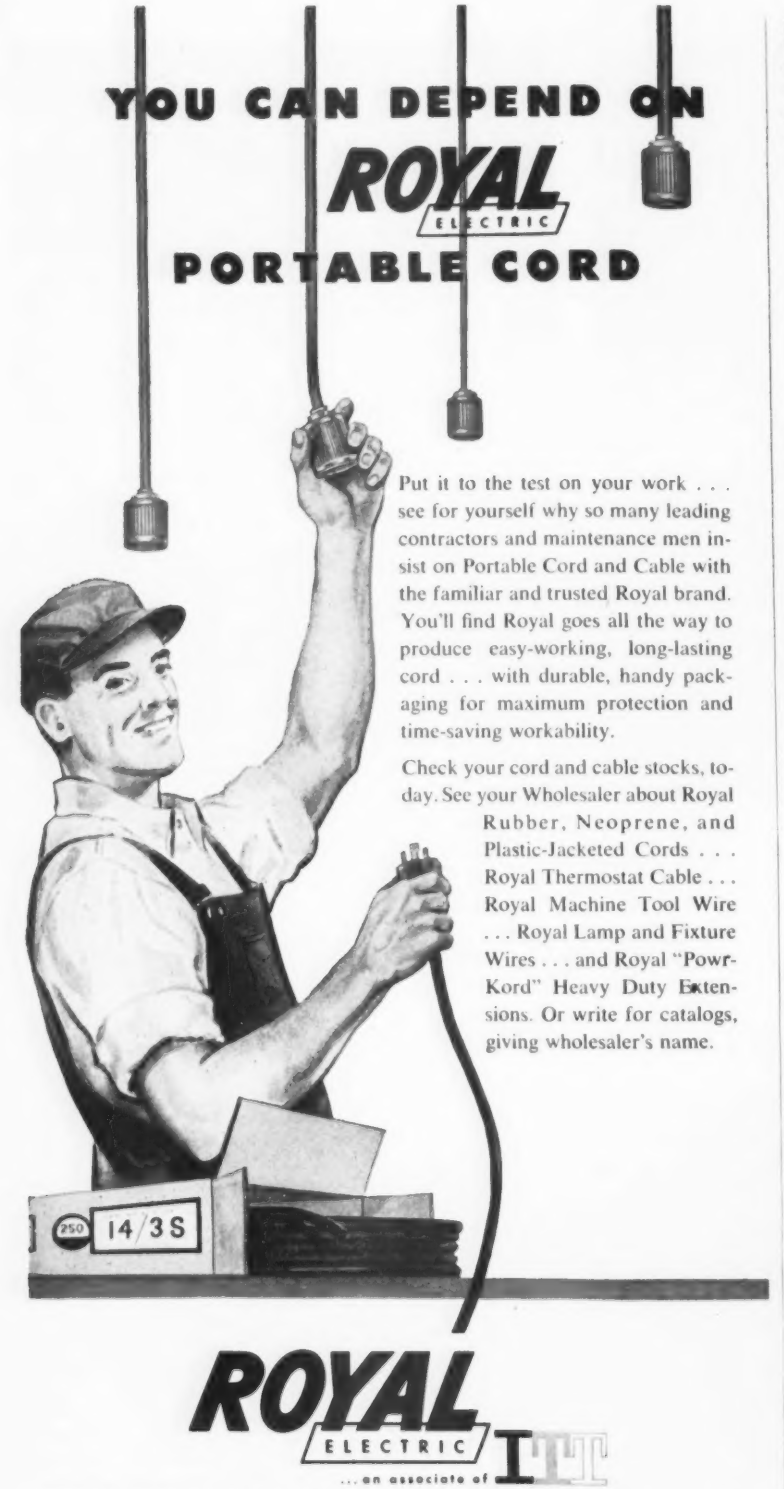
Other features of Rome's preassembled aerial cable include (a) practicality of mid-span tapping (because of reverse-lay construction); (b) improved appearance (elimination of pole crossarm hardware, in many cases); and (c) simplicity of installation.

Use Rome's preassembled aerial cable the next time you have to extend your power distribution lines. Your job will be easier and you'll save labor and maintenance expense. For more information on this product, call your nearest Rome Cable representative—or write to Department 770-B, Rome Cable Corporation, Rome, New York.

ROME CABLE

CORPORATION

YOU CAN DEPEND ON
ROYAL ELECTRIC
PORTABLE CORD



Put it to the test on your work . . . see for yourself why so many leading contractors and maintenance men insist on Portable Cord and Cable with the familiar and trusted Royal brand. You'll find Royal goes all the way to produce easy-working, long-lasting cord . . . with durable, handy packaging for maximum protection and time-saving workability.

Check your cord and cable stocks, today. See your Wholesaler about Royal Rubber, Neoprene, and Plastic-Jacketed Cords . . . Royal Thermostat Cable . . . Royal Machine Tool Wire . . . Royal Lamp and Fixture Wires . . . and Royal "Powr-Kord" Heavy Duty Extensions. Or write for catalogs, giving wholesaler's name.

ROYAL ELECTRIC
. . . an associate of I-T-E

ROYAL ELECTRIC CORPORATION • PAWTUCKET R. I.

SALES REPRESENTATIVES AND WAREHOUSES: Los Angeles—1950 Naomi Avenue, RI 7-9655; San Francisco—1225 Sixth St., HE 1-5792; Seattle—4130 First Ave., So., MA 3-8882; Denver—888 S. Lipan Street, WE 6-3456

an electric current. The whole device has no moving parts and a 100-w power pack, lasting more than a year, would weigh less than 25 lb. Characteristics of the device make it suitable for use in space vehicles.

—EW—

A handy desk calendar with appointment note space is available to you from Hatfield Wire & Cable Division, Hillside, N. J. Send your request directly to the company.

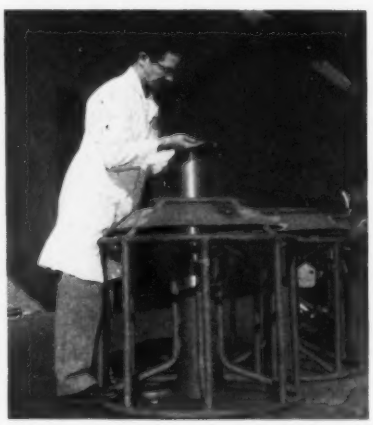
—EW—

NEW MOTTO—Paul S. Ousley of Dan Kamphausen Co., Portland, who has become Pacific Northwest representative for a line of English-built battery-driven trucks, suggests an electric industry motto of "Ride Better Electrically."

Produced by Smith's Delivery Vehicles Ltd., the two-ton van and dairy trucks are extensively used in Britain for milk, bread, laundry and paper routes. Ousley reports that the electric milk truck operates for about 4¢ per mile, including electric consumption and battery amortization, versus 10¢ to 12¢ a mile for a gasoline truck.

—EW—

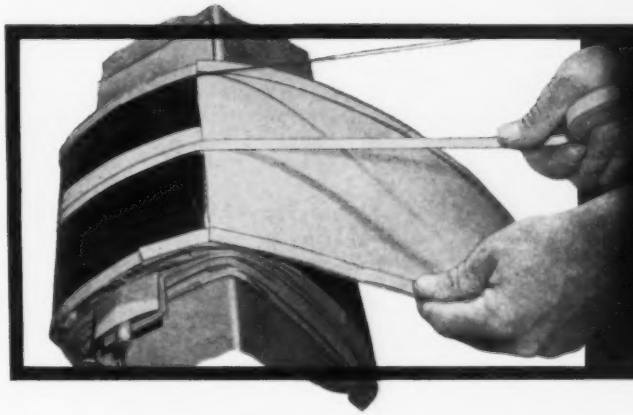
RUSSIAN "INSTITUTE OF INFORMATION"—Bell Telephone Laboratories' R. K. Honaman, director of publications, reported at the winter general meeting of AIEE on the Russian "Institute of Information," which in his opinion is "the most complete and intensive attack



This uranium fuel element is bound for the University of Wyoming for use in a reactor developed for the school by Atomics International for research and training duty

There's a good reason WHY...

Plan to stay ahead... MODERNIZE!



CRAFTSMANSHIP is emphasized at ALLIS-CHALMERS

Superior DISTRIBUTION TRANSFORMERS

THE skilled hands at Allis-Chalmers who really know how to use the tools, twist the dials, operate the machines and carefully guide the assembly along the line, in the final analysis, determine the degree of quality in the transformers.

Allis-Chalmers craftsmen work with the best materials and with modern equipment in up-to-date facilities. The transformers they build are the product of advanced research and development. The blueprints they use interpret the highest standards of design and engineering. Their efforts are subjected to stringent quality control at every step of manufacture. Finally, exhaustive tests prove their skills in finished product quality. That's why Allis-Chalmers transformers assure long years of dependable service.

For *all the good reasons why* Allis-Chalmers distribution transformers are superior, call your A-C man. Or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS A-C ALLIS-CHALMERS

A-5725

on the problem of disseminating technical information in the world."

Soviet scientists and engineers probably receive about half of the world's available technical information through the vast collecting, translating and disseminating activities of the institute. Honaman reported that the institute analyzes 14,000 pieces of technical literature yearly, of which about 1,500 come from the U. S. About 14,000 technical people voluntarily participate in the institute's activities, he reported, because big brother voluntarily rewards them with knick-knacks such as free new homes, cars and the like.

—EW—

Three types of transformers for special applications bear higher price tags now, according to General Electric. The products involved are mobile transformers and mobile substations, oil-immersed current-limiting reactors and furnace transformers. Price increases are from 5% to 10% in some ratings.

—EW—

OVERESTIMATED – Dr. William W. Brickman of New York University recently commented that some American leaders have "thrown wisdom to the winds and scientific methods to the dogs" in a tendency to overestimate the Soviet educational system.

Continuing, he said, "I feel that American leaders have tended to overrate the foreign-language training program of the Soviet schools, that we have overlooked the overlarge classes and the multiple sessions, that we did not take proper cognizance of the underpaid teachers in the lower grades, and that we have shut our eyes to the supreme role of the Communist Party and Communist ideology in all aspects of Soviet education."

—EW—

ATOMIC FILMS AVAILABLE – The Atomic Energy Commission announced that 45 technical-level, professional motion pictures, first screened last September in Geneva at the Second International Conference on the Peaceful Uses of Atomic Energy, are available for loan. The films are 16 mm, mostly in color, and the list includes 10 films on power reactors, nine on research and test reactors, seven on fuels and processing, one on controlled thermonuclear research and two on industrial applications. They will be lent on request to industry, advanced educational institutions, research organizations from AEC film libraries. In the West, film libraries are located at Idaho Falls, Idaho; Grand Junction, Colo.; Albuquerque, N. M.; Oakland, Calif.; and Richland, Wash.

This is the fully automatic household ultrasonic dishwasher developed by Narda Ultrasonics Corp. It will be displayed publicly in New York's Radio Engineering Show this month. The unit is a mobile, roll-around type about the same size as a conventional dishwasher and has about the same water consumption. The main difference is the ultrasonic wash cuts the cycle to from 12 to 15 minutes, half the time required for the conventional dishwasher

—EW—

When Howard C. Seefred was turned down for military duty 41 years ago, he got a job with the Los Angeles Department of Water & Power as a meter reader. When he retired recently, after having read more than 3,000,000 meters and walking all day long every working day, he revealed why Uncle Sam had found him unfit for duty. He had flat feet.

—EW—

INJUN TROUBLE IN N. Y. – Easterners who sometimes think that everything west of the Mississippi is Indian country may be surprised to learn that Indians can create problems in the East, too. Last month the Federal Power Commission ruled that the license issued last year to the New York State Power Authority for redevelopment of the Niagara Falls hydroelectric project would interfere and be inconsistent with the purpose for which the Tuscarora Indian Reservation was created. The power authority had proposed to use over 1,300 acres of Indian land for a pumped-storage reservoir. As no alternate reservoir site appears practical, the decision radically changes the economics of the whole Niagara redevelopment project.

—EW—

A new gimmick to point up the Medallion Home was devised by Moloney Electric Co. which recently shipped a quantity of distribution transformers having a permanent gold finish. The units will be installed on three Northeastern power systems in areas having Gold Medallion Homes.

—EW—

DO-IT-YOURSELF POLITICS – The Chamber of Commerce of the United States officially launched its Action Course in Practical Politics to help businessmen become more active and effective on the political scene. The course consists of nine workshop sessions, which can be organized by any business firm or association. Discussion leaders' manuals, including case problems and material for 20 participants, are available at a cost of $12 each plus a $6 charge for a set of pamphlets that serve as working texts.

—EW—

HEIGHTSIGHT – What are the building blocks for success in engineering? Westinghouse Electric's G. E. Moore, commenting on "1,200 Case Studies of Engineering Motivation," pointed out that 89% of the 1,200 men involved have spatial visual scores 175 points above the national mean.

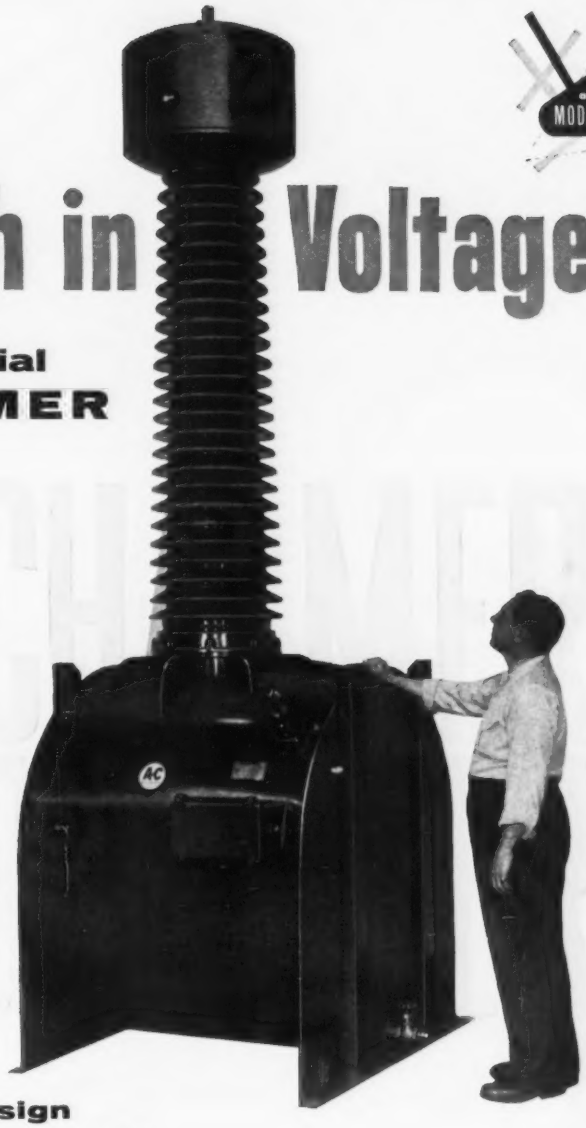
"This would indicate a rather high ability to translate the spoken word, analytical terms, ideas, etc., into three-dimensional mental images ultimately leading to realistic devices."

The study indicated that personal motivation could overcome a poor academic record. Contrary to some beliefs, it was found that "external trappings" had little or no effect in motivating engineers.

Plan to stay ahead... MODERNIZE!

New High in Voltage

230-kv potential TRANSFORMER



compact design reduces weight 60%

The new Allis-Chalmers 230-kv instrument transformer marks a new high in voltage for potential transformers using modern design principles. This compact design, which includes the application of better insulating materials and eliminates the use of oil-filled condenser type bushings, results in a weight reduction of 60% less than possible in conventional construction.

Advanced corona-free design in tank and bushing

The entire line of Allis-Chalmers potential transformers, from 24 kv through 230 kv, can withstand long voltage stresses and short-time surge conditions. Internal corners and coil edges are protected by formed insulating channels which fit close to coil surfaces — effectively prohibiting formation of corona and the development of leakage paths. The one-piece high voltage porcelain bushing, integral with the primary winding, incorporates the same corona-free design features used in the transformer.

Easy handling, simplified installation, improved performance in ratio and phase angle, hermetically sealed tanks for less maintenance — for the details of all these features and advantages, contact your A-C man, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wis.

A-C ALLIS-CHALMERS

A-5833

PULL WIRE IN
Minutes
...NOT HOURS!

WITH THE *Jet Line Gun*

Eliminate fish tape and the long hours spent in snaking!

Use the Jet Line Gun to shoot a strong nylon line through conduit . . . then draw polyethylene rope through and you're ready to pull wire . . . in minutes, not hours!

A small jet-propelled cartridge does the trick, twisting around ells and bends, up and down as it lays the nylon line in runs up to 300 ft. . . . double this distance when shot from both ends of the run!

The Jet Line system is safe . . . there's no powder charge or explosion . . . and both nylon line and polyethylene rope are non-conductors.

The Jet Line system is accurate. You can't waste wire because the polyethylene rope is marked in feet to measure the exact length of wire you need.

The Jet Line Gun was invented by experienced electricians and is now in use by thousands of contractors. It replaces fishing in rigid and flexible steel conduits, under-floor ducts, cavity wiring structures and underground ducts. Goes through floor boxes and C conduiets.

Order your Jet Line Gun kit today and save time, money and wire on your jobs from now on.

Ask your distributor or write

Pat. Pending on Method and Apparatus

Jet Line Gun Company

730 Seigle Ave., Charlotte, N. C.

3277

Copyright 1958 Jet Line Gun Co.

WHAAA-T?—Have you ever heard of a tax engineer? Internal Revenue Service says that tax collection is an emerging field for engineers, and has undertaken to explain why in a pamphlet called "Engineer Tax Men."

—EW—

MERGER — Two well known societies will be merging. They are the American Society of Heating & Air Conditioning Engineers and the American Society of Refrigerating Engineers.

The consolidated society will be named the American Society of Heating, Refrigerating & Air Conditioning Engineers.

—EW—

California factory workers earned an average of over $100 *per week in December. This was the first time the state-wide average had exceeded the* $100 *figure in contrast to the U. S. average for manufacturing of* $88 *per week for the same month.*

—EW—

General Electric Co. announces a development program for ceramic reactor fuels at its Hanford atomic works. The big advantage of ceramic reactor fuels is that they can withstand temperatures up to 5,000 F — over three times as high as fuel elements used in present-day reactors.

—EW—

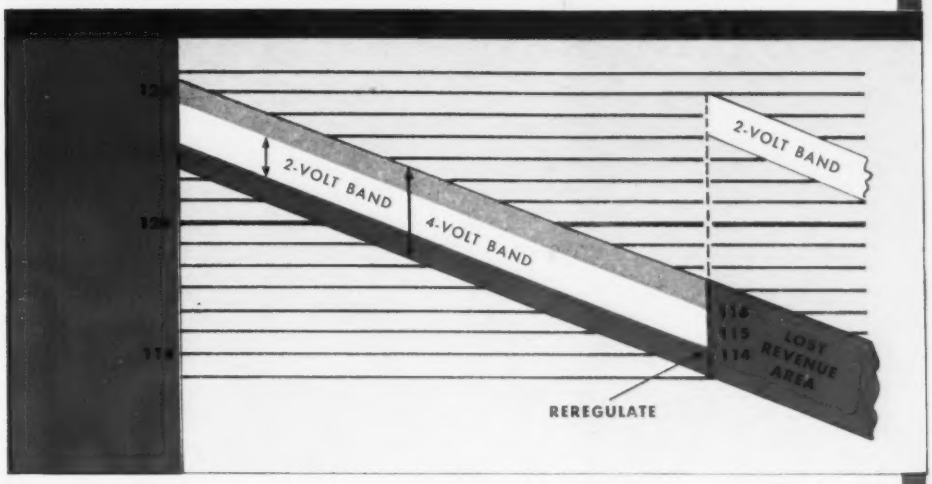
America's multibillion-dollar interstate highway system may be 50% obsolete by the time it is completed, Harold A. Olson, a General Electric vice-president, said recently. He alluded to the fact that the nation's highway network may be safe and usable to full advantage only during daylight hours as a result of inadequate lighting.

—EW—

The National Noise Abatement Council recently presented a certificate of award for research and application on the reduction of noise in power transformers to Westinghouse Electric Corp.'s Transformer Division. The council acts as a clearing house for information on noise problems.

ALLIS-CHALMERS — 25 years of 5/8% Regulator Leadership

Losing revenue?



Here are 4 steps to increased revenue!

"Engineered regulation" provides added revenue — improves service while cutting regulation cost as much as 50%. Each single volt increase in average voltage on a feeder (toward the optimum) means $1 per customer per year increased revenue. At the same time "engineered regulation" is lower cost regulation.

Four basic steps are:

1 Cut band width to two volts.

2 Reregulate feeders.

3 Use low-cost 5/8% step regulators.

4 Engineer to *fully* utilize *Vari-Amp.*

Allis-Chalmers leadership and engineering experience are ready to help you work out a four-step regulator program.

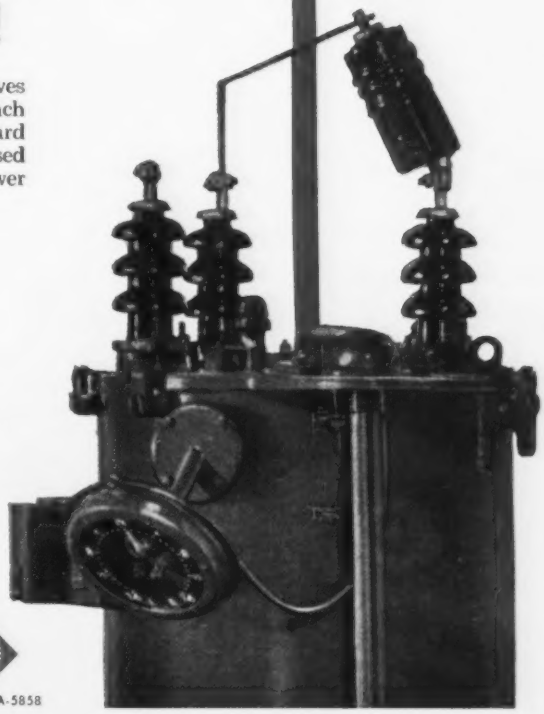
Contact your nearby Allis-Chalmers office, or write Allis-Chalmers, Power Equipment Division, Milwaukee 1, Wisconsin.

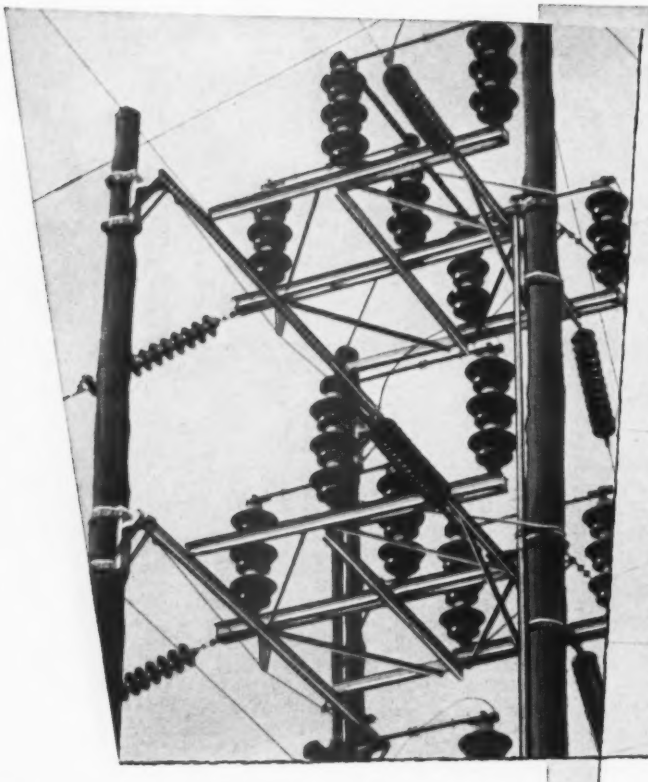
Originators of 5/8% Step Regulators

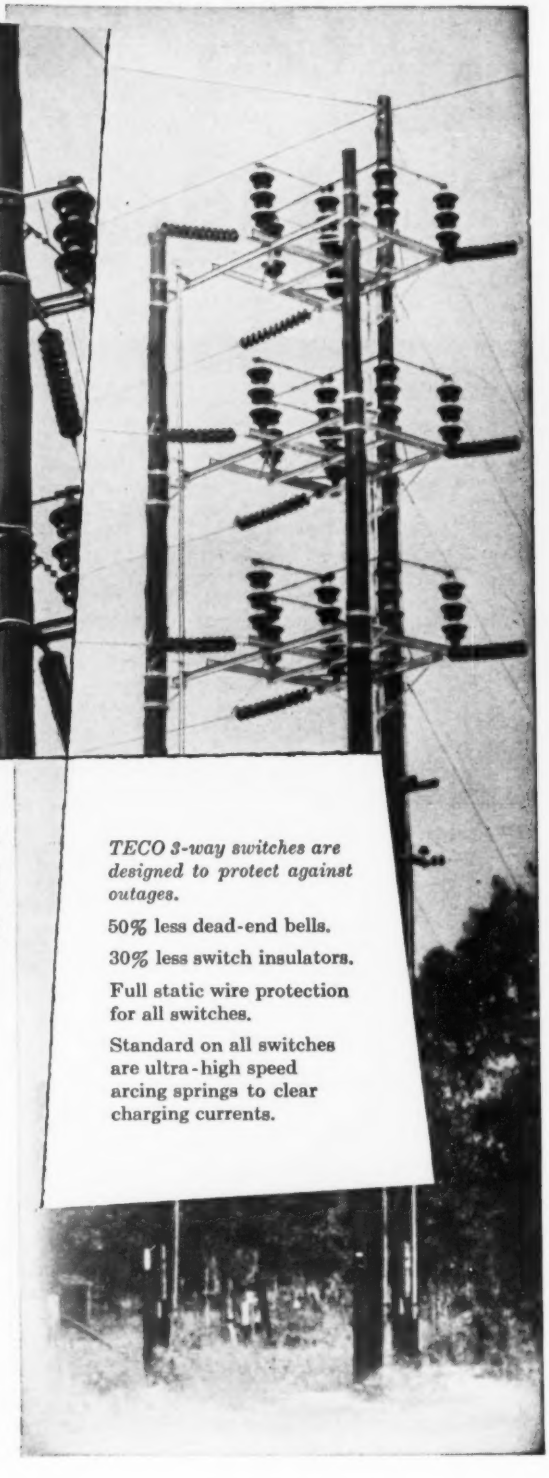
ALLIS-CHALMERS

Vari-Amp is an Allis-Chalmers trademark.

A-5858







NEW! TECO 3-way, 115 KV switches mounted on only 3 poles instead of conventional 12 pole mounting

TECO 3-way switches are saving utilities up to 50% on installation costs—and provide the convenience of one switching location.

Save on real estate. A three pole mounting takes only a fourth of the area required by 12 poles. This makes TECO switches especially suitable for suburban areas where land is at a premimum.

Save on materials and maintenance. With TECO 3-way switches, there are 9 fewer poles and far less hardware to buy. Not only is your initial cost lower, but you realize additional over-the-years' savings because there is less equipment to maintain.

Save on line-crew time. A complete TECO installation can be handled by one line-crew in about 16 hours, whereas, a conventional installation can require up to 48 hours for one line-crew to complete.

Available switch sizes are 15KV thru 161KV from 600 to 1200 amps. For information on money-saving TECO 3-way switches, write today for bulletin 101.

TECO 3-way switches are designed to protect against outages.

50% less dead-end bells.

30% less switch insulators.

Full static wire protection for all switches.

Standard on all switches are ultra-high speed arcing springs to clear charging currents.

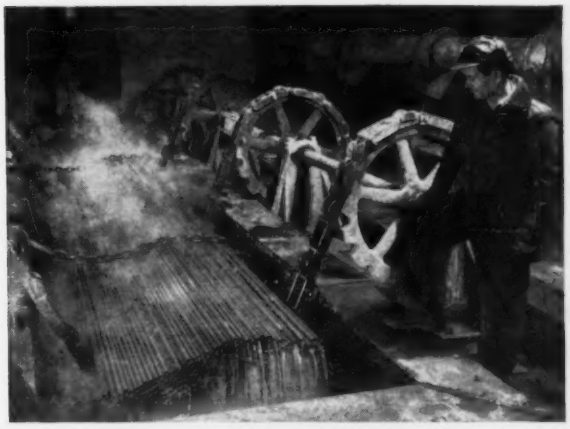
TURNER ELECTRIC CORPORATION

9500 ST. CLAIR AVE. EAST ST. LOUIS, ILLINOIS

Complete Line of Air Break Switches • Flexi-Band and thru Bolt Cluster Transformer Mounting Brackets • Dead-End Band Brackets

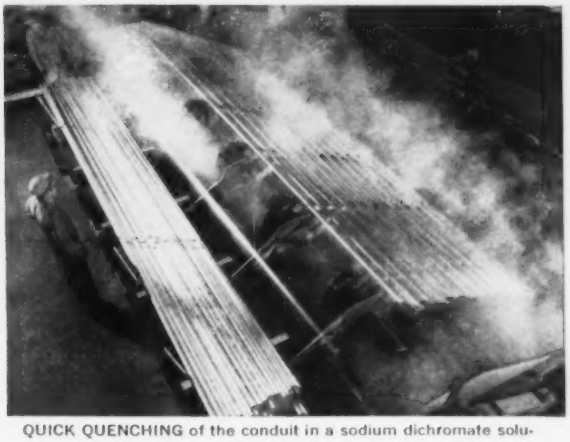
These 4 steps show why SPANG brings you the best galvanized steel conduit!

THOROUGH CLEANING of the conduit before galvanizing removes all dirt, grease and scale, leaves a clean surface for the prime western zinc galvanized finish.



STEAM-WIPING of the conduit's exterior, as it comes from the kettle through an air ring, produces a smooth even finish that will stand up under severe bending.

SUPERHEATED STEAM blown through the conduit interior removes excess zinc inside, assures a smooth, uniform surface for easy wire pulling.



QUICK QUENCHING of the conduit in a sodium dichromate solution bonds the galvanized finish to the steel, adds extra service life, helps prevent white rust formation.

This is just part of the *quality-control* processing that each length of Spang HD Galvanized Conduit receives. Careful control from skelp through the inspection tables assures you of a *top-quality* conduit for *top-quality* installations. Try it on your next job! Your local Spang Distributor is at your service!

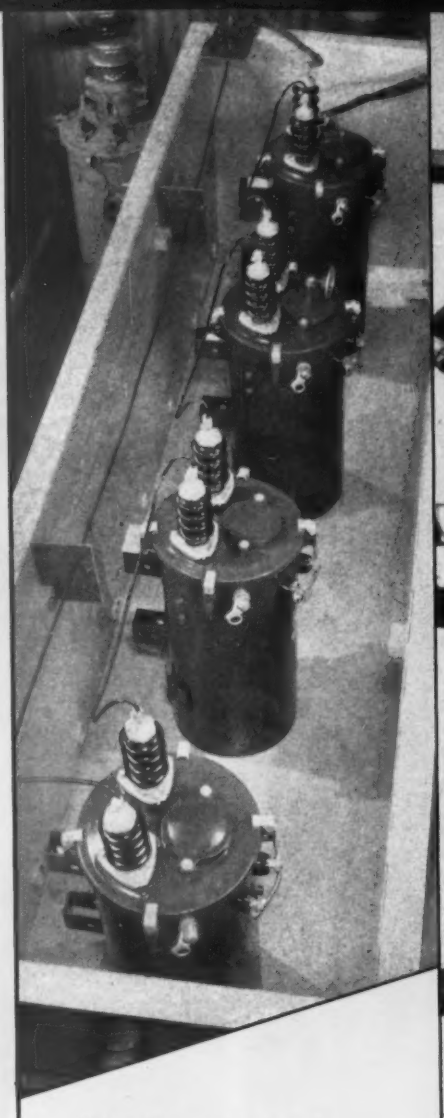
THE NATIONAL SUPPLY COMPANY

SPANG® CONDUIT

Subsidiary of Armco Steel Corporation

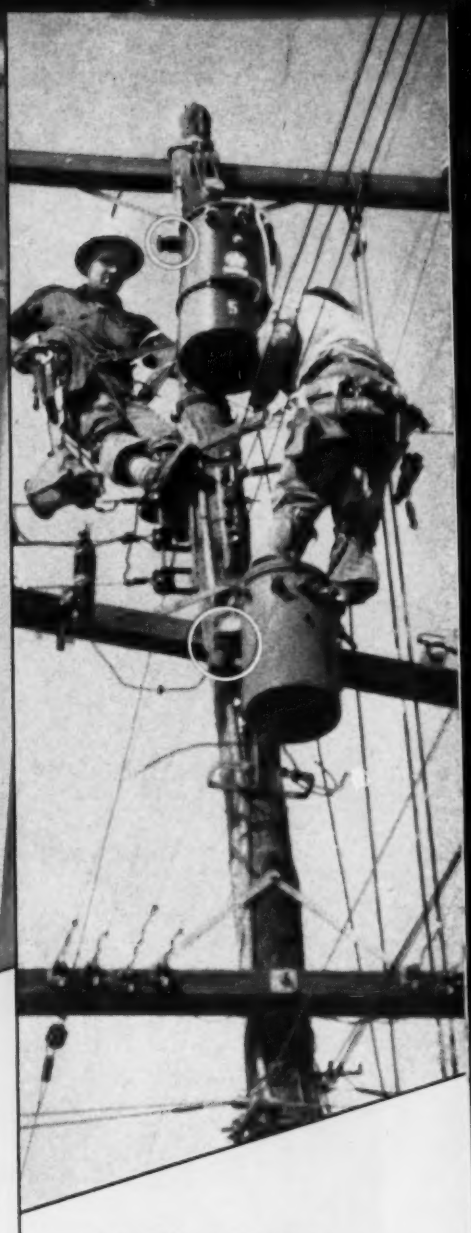
TWO GATEWAY CENTER, PITTSBURGH, PA.

Many improvements in distribution transformers are initiated by Pennsylvania **Pole Star** transformers



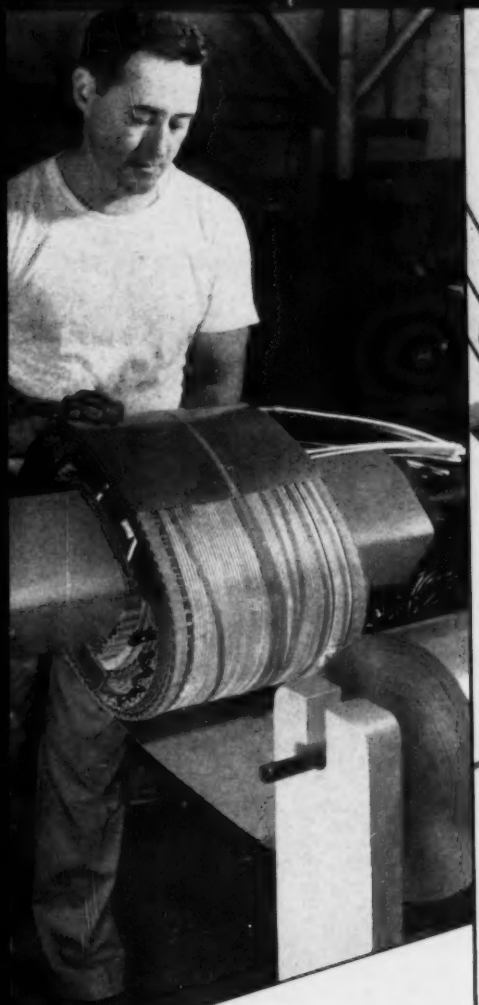
Test Programs and Committee Work Further Industry-wide Progress

Since the inception of an AIEE program in 1956, Pennsylvania Transformer Division has been actively participating in a series of insulation life tests. By contributing time, facilities and personnel, and by taking part in other committee activities and projects of AIEE, EEI and NEMA, Pennsylvania is helping to provide the entire electrical industry with valuable information and guidance.



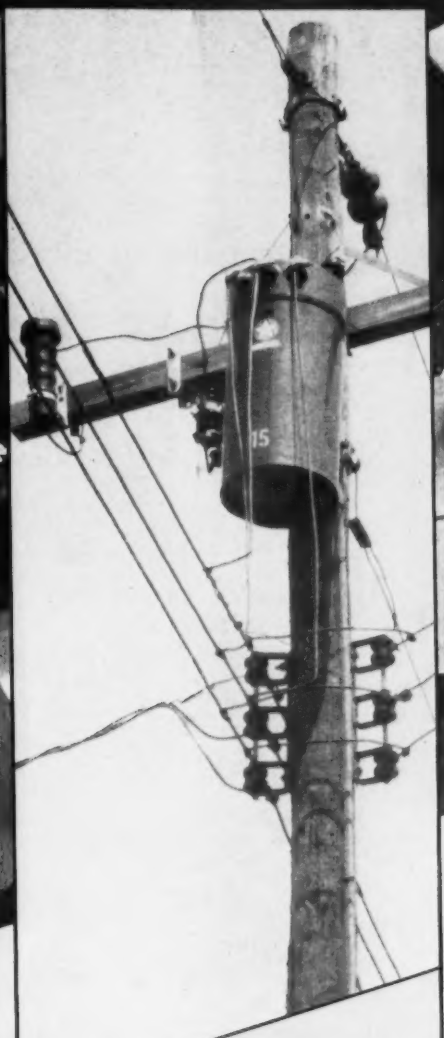
Pole Star's Stud-type Sidewall Bushings Eliminated Pockets

When the Pole Star was introduced more than eleven years ago, Pennsylvania pioneered the use of streamlined, leak-proof, stud-type bushings. Such innovations —when improved materials and techniques make them feasible— are typical of Pole Star leadership.



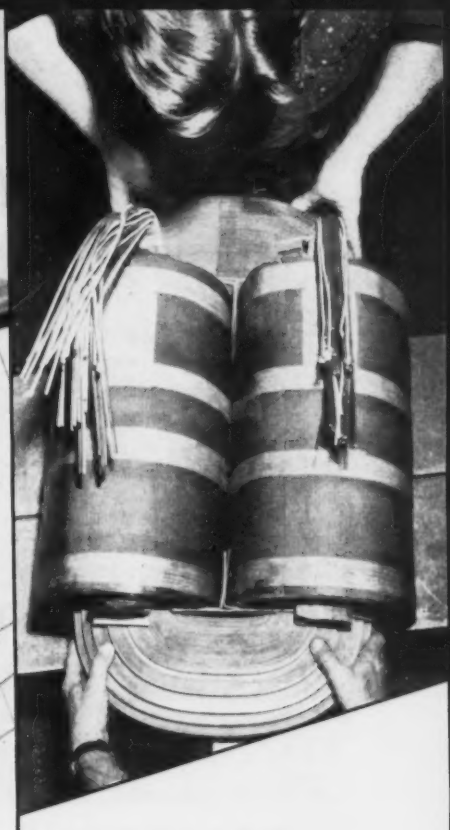
High-Strength Insulation System Gives Pole Stars Greater Life Expectancy

Introduced almost without fanfare more than four years ago, the Pole Star insulation system has been proved equal to or better than all other systems from the all-important standpoints of insulation strength and life expectancy. The system consists largely of pre-treated insulating materials that include corrugated spacers and specially processed kraft paper that possesses exceptionally high electrical and mechanical strength at higher-than-normal operating temperatures.



First Completely Sealed Distribution Transformers Now in Actual Service

The "Perfect Seal" Pole Star—a completely sealed distribution transformer—appears to be the transformer-of-the-future as a result of present trends toward the elimination of taps in many voltage classes. Working with various electrical utilities throughout the United States, Pennsylvania has distributed a number of completely sealed distribution transformers for "in service" observation and testing.



Lap-on-Top Core One of Four Basic Distribution Cores

The patented lap-on-top Pole Star core is one of but four basic distribution cores being used today. Designed to take full advantage of the inherent characteristics of cold-rolled, grain-oriented silicon steel, it is notable for its low exciting current, low core loss and consistently high quality.

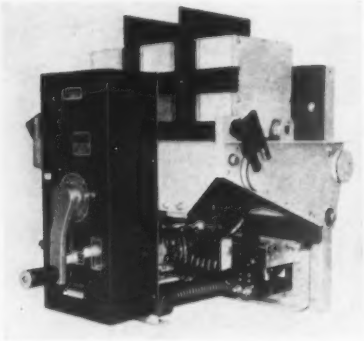
McGRAW EDISON

Pennsylvania Transformer Division

McGraw-Edison Company
CANONSBURG, PENNA.
Greater Pittsburgh District

PRODUCT NEWS

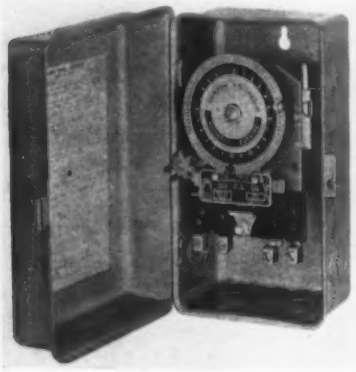
New Designs and Applications



Circuit Breaker

(1) *Allis-Chalmers Mfg. Co., 1126 S. 70th St., Milwaukee 1, Wis.*

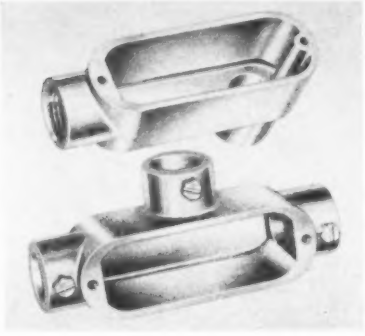
This company is introducing a new low voltage power circuit breaker rated at 75,000 amp interrupting capacity at 2,000 and 3,000 amp current carrying capacity. The new breaker provides both electrically and manually charged stored energy closing mechanisms on each unit. Loss of control voltage during closing, as when closing against a fault, has no effect on the closing ability of this stored energy device, the company reports. Manual charging of the springs is by rotating a hand crank about 20 seconds.



Two-Circuit Time Switch

(2) *Tork Time Controls Inc., Mount Vernon, N. Y.*

A two-circuit time switch, for switching the heavy loads used in apartment house, building and parking lot lighting, is now a part of this company's standard line. It contains two sets of single-pole single-throw contacts. The switch will turn two lighting circuits on at one time, and turn them off independently. The unit is also available with a feature that keeps the time switch in "on time" operation in the event of power failure. No readjustment is necessary when power is restored. Available with a choice of controls.



Aluminum Fittings

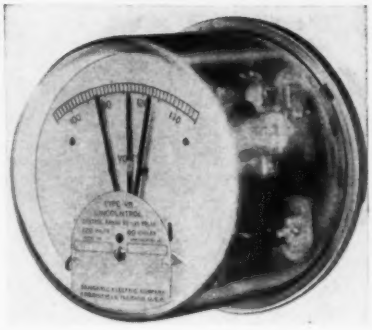
(3) *L. E. Mason Co., 100 Business St., Boston 36, Mass.*

This company is offering new aluminum fittings that have as features increased strength, finished surface and smooth interior for easier pulling and splicing.

Power Transformer

(4) *General Electric Co., Schenectady 5, N. Y.*

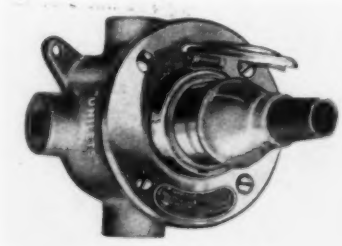
A new type of "triple-rated" large power transformer, equipped with new flat-type cooling tubes, is announced by this company. The new transformers use pumps, in conjunction with fans, to reach the third or highest rated cooling stage. At light and intermediate loads the pumps do not operate. The new flat tubes on the self-cooled and multiple-rated units supersede the round tubes formerly used. Reduction in floor space requirements is a benefit. The new transformer replaces the former OA/FA/FA type.



Capacitor Control

(5) *Sangamo Electric Co., Springfield, Ill.*

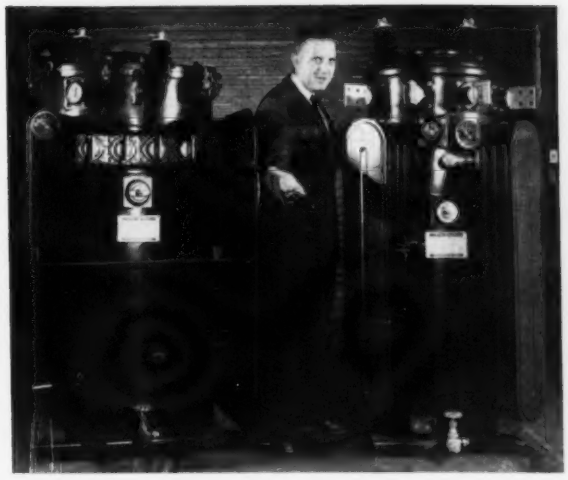
A new capacitor voltage control designed to provide greater economy in capacitor switching is announced by this manufacturer. It is a simplified version of the company's Lincolntrol with the counter, manual switches and fuse eliminated. It operates from a 120-v signal and control power source and will handle three single-phase capacitor oil switches.



Dead-End Receptacle

(6) *Appleton Electric Co., 1701 Wellington St., Chicago, Ill.*

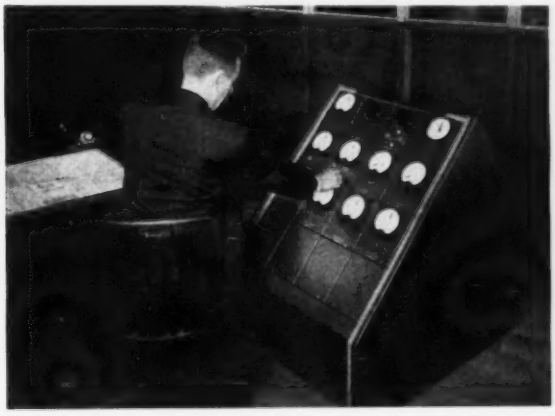
This company has developed a dead-end contact feature for explosion-proof receptacles for flush wall mounting. Arcing is confined within a plug combustion chamber. No live contacts are exposed to the atmosphere. The devices are available with or without adjustable sleeve to accommodate varying wall thicknesses and include Unilet and close-up plug.



Substation Transformers

(7) *General Electric Co., Schenectady 5, N. Y.*

A new line of single-phase substation transformers announced by this company are said to be smaller, lighter and more efficient in all ratings than the models they supersede. The line has standard ratings up to 500 kva, 15 kv. A typical 250-kva unit compared to the equivalent 1948 model with tube-type radiators is 32% lower, 42% lighter and requires 35% less floor space. A completely redesigned core-and-coil assembly and new manufacturing techniques led to the improvements. Each transformer has a tank base, externally operated load tap changer, temperature gage, and other fittings to conform with EEI-NEMA standards.



Automatic Dispatch System

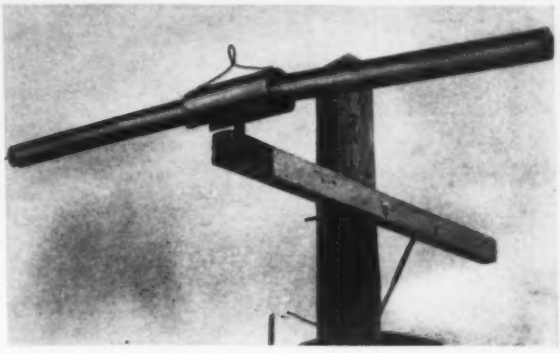
(8) *Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.*

This new automatic dispatching system features the integration of economics into the control of system generation to match load. New theories and techniques were developed and the company is presently building a simulating system to test the principles involved. Actual dispatching equipment will be used, with simulated inputs to the equipment, and the output fed to a simulated power system.

Combination Fixture-Diffuser

(9) *Pyle-National Co., 1334 N. Kostner Ave., Chicago 51, Ill.*

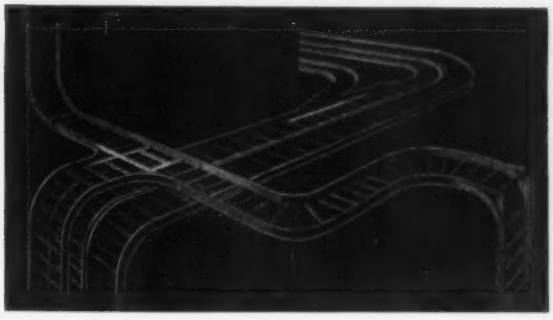
A new combination ceiling light fixture and air diffuser is offered by this manufacturer. It is a flush-mounted fluorescent lighting fixture that hides a low velocity air diffuser, and is designed to be placed immediately above electronic data processing machines. Air flow is through tiny slots in the light fixture. The lighting component in the unit is manufactured by Benjamin Electric Mfg. Co.



Power Line Hood

(10) *Safety Live Line Tool Co., 973 86th Ave., Oakland, Calif.*

An electrical-grade plastic laminate has replaced redwood in the manufacture of this company's insulator hoods and line covers used for prevention of accidental contact with conductors. The new phenolic covers are about 25% lighter, outlast redwood, have high dielectric strength and cost about the same, according to the manufacturer.



Cable Trays

(11) *Husky Products Inc., 5300 Vine St., Cincinnati, 17, Ohio*

A new line of cable trays made in an all-welded construction from either aluminum alloy extrusions or from roll formed steel channels, hot-dip galvanized after fabrication is announced by this company. The trays are 4 in. deep and have cross-rungs set at the bottom to provide greater cable carrying capacity. Rungs are spaced on 9-in. centers.

LABORATORY CONTROLLED...

Crapo

GALVANIZED STEEL STRAND FOR GUY, MESSENGER and OVERHEAD GROUND WIRE

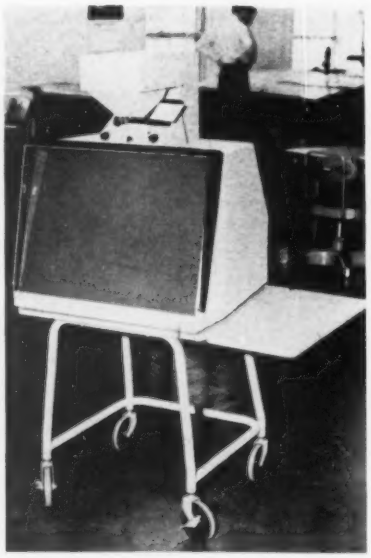
The high, uniform, consistently-dependable quality of Crapo Galvanized Steel Strand is the direct result of close laboratory control over each step in manufacture. All wires used in forming a particular size and grade are produced from steel of selected analysis, carefully processed under technical supervision and stranded on precision machines. Both wire and finished strand are subjected to prescribed laboratory tests to insure the desired end result.

Heavy, uniform, tightly-bonded zinc coatings, applied by the famous *Crapo* Galvanizing Process, provide maximum resistance to corrosion.

Write for booklet OG-25 containing "Sag and Tension Data for Overhead Ground Wire."

INDIANA

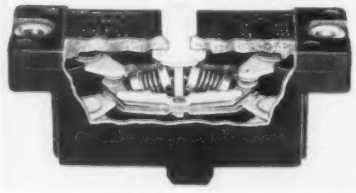
STEEL & WIRE CO., INC., Muncie, Indiana



Microfilm Reader

(12) *Filmsort Co., Pearl River, N. Y.*

Known as the Designer 184, this new microfilm reader has a screen size slightly larger than 18x24 in. with an optical system that covers the entire microfilm frame within the aperture. With a nominal magnification of 15 times, the microfilm reader enlarges A, B and C drawing sizes filmed at 16X reduction to almost full size. Larger drawings, filmed at 30X reduction, are enlarged to half size.



Limit Switches

(13) *Cutler-Hammer Inc.*, 234 N. 12*th St., Milwaukee* 1, *Wis.*

A new line of precision limit switches, designed for industrial applications where millions of operations are required, has been announced by this company. Outstanding feature is said to be a movable contact assembly utilizing two compressed coil springs to provide a quick make and break action. A leaf spring, carrying the contacts, assures adequate contact pressure at all times.

Series Multiple Switch

(14) *Moloney Electric Co., St. Louis* 20, *Mo.*

This company has developed a new type of S-M switch which, in addition to the present S-M switch made by the company, makes it possible for utilities to obtain Moloney S-M single-phase distribution transformers with almost any combination of high-voltage ratings, 18 kv and below. Moloney S-M transformers are distribution transformers with two high voltage ratings and equipped with externally operated switch to connect the high-voltage winding for use at either rated voltage.

Underground Connector

(15) *Dossert Mfg. Corp.*, 249 *Huron St., Brooklyn, N. Y.*

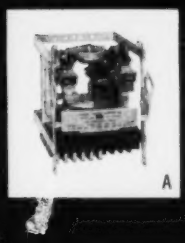
This new tapeless underground connector is specially designed for residential and industrial distribution systems. Fully insulated, it joins up to eight electrical cables where watertightness must be insured. No extra components are necessary to accommodate a wide range of cable sizes in any outlet position.

Aluminum Floodlight

(16) *Steber Mfg. Co., Broadview, Ill.*

This manufacturer announces the availability of a new aluminum 24 in. diameter enclosed floodlight for 700-1,000-w mercury vapor lamps. Furnished in five mounting arrangements, the new floodlight line includes thermal shock and impact resistent lens, stainless steel lens ring and hinge and stainless steel clips. The units are weatherproof.

Reliable Protective Relays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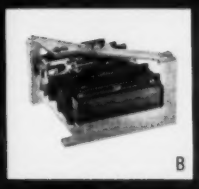
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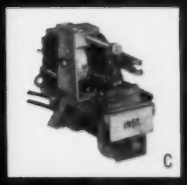
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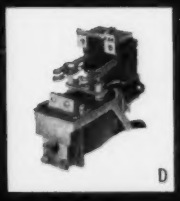

D

E

...the heart of quality switchgear

This proud new line of protective relays makes Federal Pacific one of only three companies able to furnish all major switchgear components, thus providing for complete quality control and undivided responsibility.

Featuring utmost reliability as well as unusual sensitivity, stability, accuracy, and simplicity, there are only three basic movements—induction disk, induction cup, and hinged armature. Any desired a-c relay characteristic can be provided through variations of the induction disk and induction cup units. What's more, these relays are designed for minimum maintenance and testing time.

A—BASIC INDUCTION DISK UNIT. Used with relays requiring adjustable time characteristics. Note separate connector on bottom which permits removal of the mechanism from the case by merely sliding it forward. No parts need be removed or wires disconnected.

B—BASIC INDUCTION CUP UNIT. This basic unit is used for instantaneous relaying applications where operating times of a cycle or less are required.

C—BASIC HINGED ARMATURE UNIT. Extremely flexible unit for use with a-c or d-c, current or voltage—with hand, self, or electrical reset contacts, circuit opening or closing, or combinations.

D—OPERATION INDICATORS. All induction relays have a combined electrical operation indicator and seal-in contactor of hinged armature design.

E—TEST PLUG. Permits complete secondary tests and checking of all connected circuits. Insertion of the plug instantly transfers relay to test circuit, removal automatically restores relay to service. Alteration of links or connections on the panel is avoided - testing is reduced to a fraction of the time normally required.

Rugged... simple... precise... and reliable. Yes, these new protective relays are worthy of your trust—as is all Federal Pacific electrical distribution and control equipment. Get the best! Write for Relay Bulletin 5-020, Federal Pacific Electric Company, General Offices: Dept. 290, Newark 1, New Jersey.

FPE

FEDERAL PACIFIC ELECTRIC COMPANY

The Best in Electrical Distribution and Control Equipment.

FEATURING A COMPLETE LINE
OF
SERVICE AND MAINTENANCE BODIES

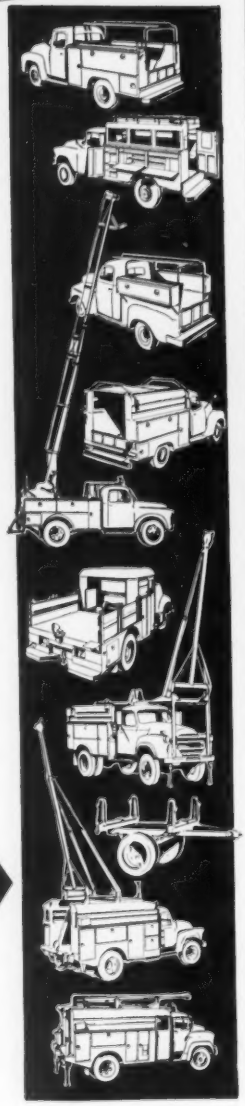
The SERIES S-X SERVICE BODY features both front and rear VERTICAL door arrangement to utilize every inch of Body space.

The design of the SERIES S-X Compartment layout purposely encourages the storage of heavy material ahead of rear axle and lighter equipment in the rear. Rear vertical compartments are supplied with hooks to provide hanging of ropes, belts, and climbers. Horizontal and front vertical compartments contain material shelves, parts bins, and adjustable trays for storage of heavier tools and supplies on top of and ahead of rear axle. SERIES S-X SERVICE BODY provides three or more large compartments completely eliminating small, useless catch-all compartments or deep wells.

OUTSTANDING FEATURES INCLUDE:

- **Double mouldings around all door openings providing doors with triple sealing action keeping compartments water tight.**
- **Rub Rail to protect sides of body.**
- **Drip mouldings above all doors.**
- **Chains supplied so that horizontal door provides a horizontal work table when open.**
- **Precise workmanship and careful finishing result in equipment on which you are proud to display your name.**

Tell us your problems. Utility Body's Custom Design Service solves them by building to your requirements without additional cost.

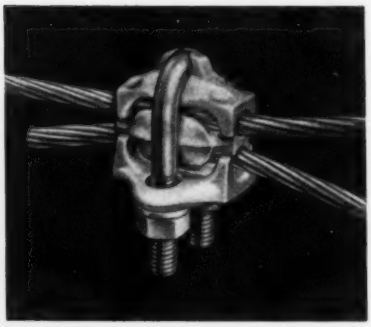


COMPLETE LINE

There IS a UTILITY BODY to fulfill YOUR OWN Specific Requirements! Contact UTILITY BODY COMPANY for data on the SERIES S-X SERVICE BODIES or telephone your nearest distributor for complete information on UTILITY BODIES.

UTILITY BODY CO.

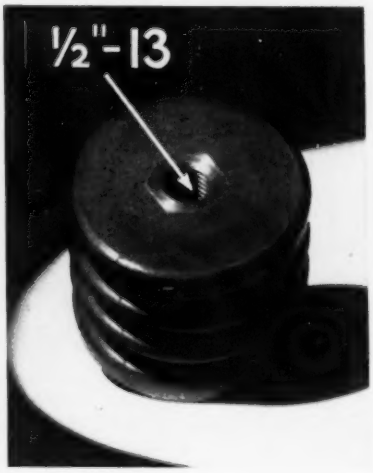
1530 WOOD STREET • OAKLAND 7, CALIFORNIA • TWINOAKS 3-8980



Dead-End Clip

(17) *Burndy Corp., Norwalk, Conn.*

This new high-strength aluminum alloy connector is designed for secondary distribution dead-ending and tap applications. Two sizes cover cable range No. 6 through 2/0 aluminum or 1/0 ACSR. The company says it exceeds the rated breaking strength of ACSR cable on most sizes. It has captured galvanized steel U-bolts and self-aligning parts for easy installation. A generous wrap-around spacer permits use of the unit as a tap connector.



Standoff Insulator

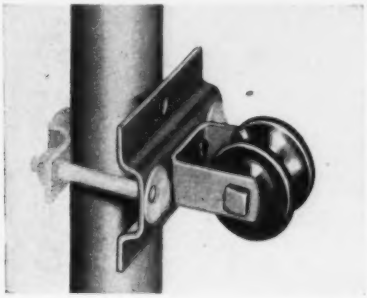
(18) *Glastic Corp., 4321 Glenridge Rd., Cleveland 21, Ohio*

A new Glastic 2⅛-in.-high standoff insulator is now available for apparatus and bus bar systems using ½-in. bolt mountings. The UMG 1500 compound from which the insulator is molded is UL listed for the sole support of current-carrying parts within electrical equipment when exposed to temperatures up to 150 C.

Insulator Pin

(19) *Hubbard & Co., 200 S. Michigan Ave., Chicago 4, Ill.*

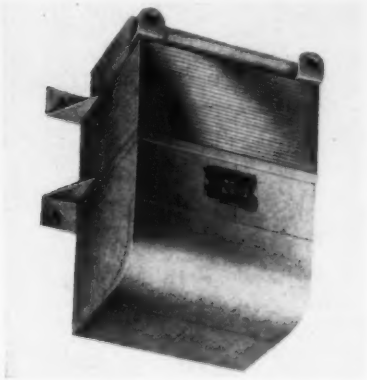
An in-use life five to six times that of pins made from carbon steel is claimed for a new insulator pin offered by this company. Another advantage is rounded wrench hold corners, preventing the danger of wear and damage to the conductor as it is pulled across the pin base. The new steel alloy is galvanized.



Wireholder

(20) *Line Material Industries, McGraw-Edison Co., Milwaukee 1, Wis.*

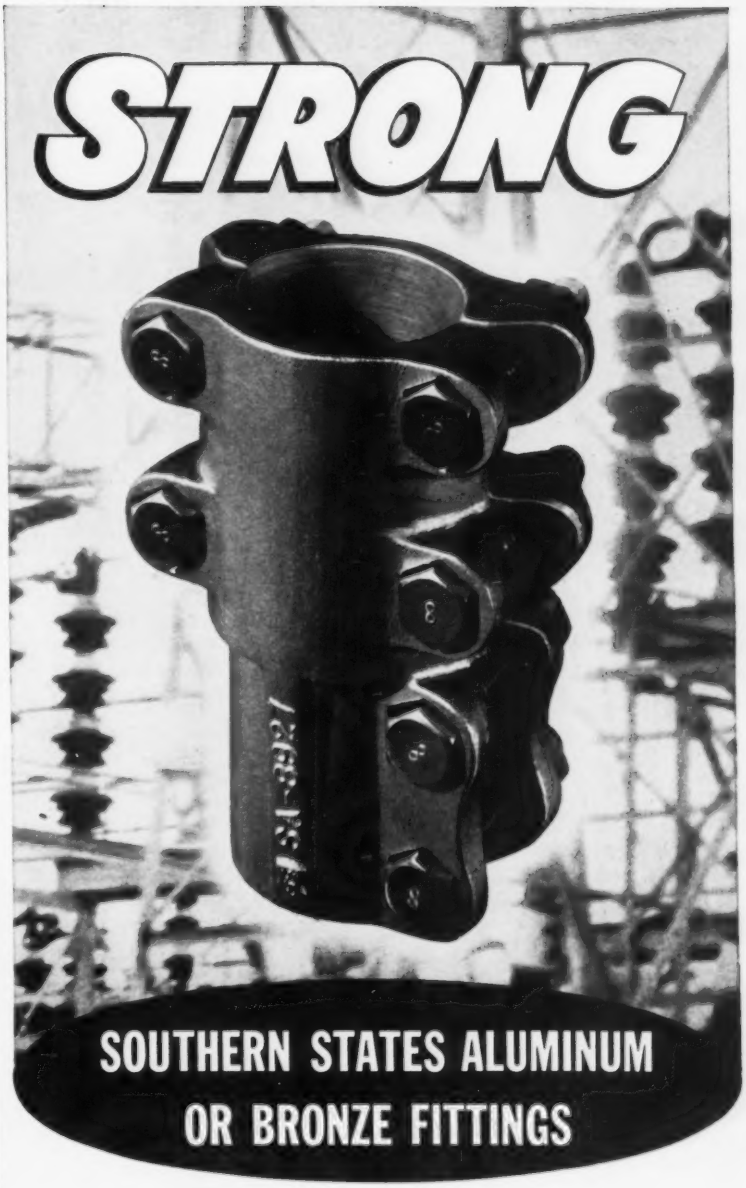
New single-point, spool-type wireholders are now available from this company. Designed to facilitate termination of triplex service drops to low-roofed structures, the wireholders may be mounted on roofs, vertical walls or pipe masts up to 2½ in. in diameter wherever dead-ending of secondary conductors is required.



Transformers

(21) *Jefferson Electric Co., 25th & Madison St., Bellwood, Ill.*

This company announces a new line of buck and boost transformers. There are 20 models available, covering 480 voltage transformations.



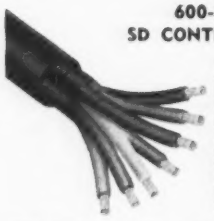
Frequent use of connectors as supporting members requires that they be physically strong as well as electrically sound. To achieve this, and yet avoid excessive bulkiness and weight, Southern States uses proven alloys—developed over a period of more than 25 years. All of the fittings in the ever-expanding line of Southern States connectors are designed to assure you of maximum strength. *Never underestimate the importance of a good connection!*

SS
SOUTHERN STATES
EQUIPMENT CORP.
HAMPTON, GEORGIA

IN CANADA: Dominion Cutout Co., Ltd., Toronto

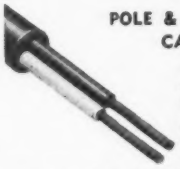
SUPERIOR POWER and CONTROL CABLES

Insulated and jacketed with modern plastics



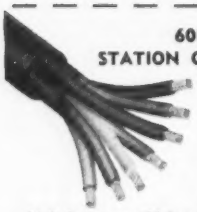
600-1000V SD CONTROL CABLE

Flexible stranded conductors insulated with polyethylene. Nylon jacket over insulation provides extra protection. Mylar tape over cabled conductors, polyvinyl chloride outer jacket.



POLE & BRACKET CABLE

For use from street lamp base or overhead circuit to lighting fixture. Insulation is polyvinyl chloride, jacket is polyethylene. Operates at relatively low voltage between conductors, high voltage from conductors to ground.



600-1000V STATION CONTROL CABLE

Conductors insulated with polyethylene. S. I. C. rating (2.3%) and Power Factor rating (.0003) remains constant at high frequency. Mylar tape over cabled conductors, polyvinyl chloride jacket overall.

FIGURE 8 POLE & BRACKET CABLE

For 0-600V service. Insulated with polyvinyl chloride. Does not deteriorate with age or weather, resists abrasion and mechanical damage, is not affected by common chemicals nor electrolysis. Will not support combustion.

SUPERVISORY CONTROL CABLE

Conductors polyethylene or polyvinyl chloride insulated. Polyethylene or polyvinyl chloride jacket. With or without shielding. Color-coded to IPCEA specifications or as desired. Composite types with twisted pairs available.

CATHODIC PROTECTION CABLE

Polyethylene insulation with polyvinyl chloride jacket or special polyethylene jacket. Highly resistant to most acids, alkalies and chemicals usually found in corrosive soil areas.

STREET LIGHTING CABLE

Thermoplastic series lighting cables for direct burial, in ducts or overhead. Highly resistant to earth acids and alkalies, moisture, sunlight and weather. With either polyethylene or polyvinyl chloride insulation and either polyethylene or polyvinyl chloride jacket. Shielded types available.

BUS DROP CABLE

Designed especially to provide flexible branch circuit runs between overhead bus feeders to shop and plant equipment. Conductors are color-coded. Insulation and jacket are polyvinyl chloride.

SUPERIOR CABLES are manufactured under a rigid quality control system and are thoroughly tested prior to delivery to assure satisfactory performance.

For complete information and prices, write

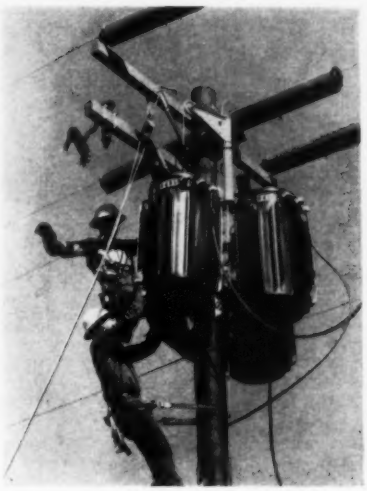
SUPERIOR CABLES

SUPERIOR CABLE CORPORATION

Hickory, North Carolina

3465

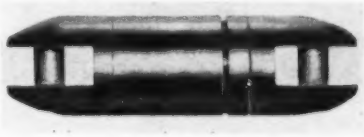
All models have a dual rated primary (120/240 v)—with a 12/24 v or 16/32 v secondary.



Transformer Hoist

(22) *Morrison-Pelsue Co.*, 2256 S. *Delaware St., Denver 23, Colo.*

Redesigning the base clamp of this transformer hoist has provided increased strength and improved the safety factor, according to the manufacturer. The two-piece unit is raised by a hand line and assembled at the top of the pole. The base clamps securely to the pole by means of pole chains and a simple, fast-operating clamp. The swivel head has been shortened to permit faster and easier assembly on the pole. Transformers are raised by power from the truck.



Stringing Swivel

(23) *Petersen Engineering Co. Inc., Santa Clara, Calif.*

A new swivel with ratings adequate for tensions employed in tension line stringing, yet compact enough to pass through stringing sheaves and bull-wheel grooves without damage, is now available from this company. The new units are special models of the well-known Miller swivels, redesigned for line stringing operation by the two companies. Available in sizes accommodating ¼-, ⅜-, ½- and ⅝-in. wire rope diameters.

BULLETINS ETC.

(24) UNDERFLOOR RACEWAYS—A new underfloor raceways catalog has been published by National Electric Products Corp., 140 Stanwix St., Pittsburgh, Pa. The 52-page catalog gives complete information about every type of underfloor distribution system. Also included is a full line of service fittings, boxes and saddle supports.

(25) FLOODLIGHT CATALOG — Crouse-Hinds announces a new floodlight catalog. It is the first new one of its kind issued by the company since 1952. For your copy of Floodlight Catalog 320 write to the company at Syracuse 1, N. Y.

(26) LIGHTNING ARRESTERS—General Electric's Form 3K Thyrite, Magnevalve station-class arresters, 60 to 276 kv, are described in bulletin GEA-6794. Performance and application data and other information are given. Write to the company at Schenectady 5, N. Y.

(27) ALCOA REPORT—Electrical applications of aluminum in the building industry are discussed in a 32-page brochure now available from Aluminum Co. of America, 754 Alcoa Bldg., Pittsburgh 19, Pa.

(28) ALUMINUM CONDUIT — Data on Kaiser Aluminum's new line of rigid conduit, couplings and 90° aluminum conduit elbows are now available in booklet form. Diameter and length dimensions, weights and packaging details are given for all standard commercial trade sizes. Copies may be obtained from Kaiser Aluminum & Chemical Sales Inc., Dept. NR-26, 919 N. Michigan Ave., Chicago 11, Ill.

(29) COLOR MOVIE — A 10-minute, 16-mm sound and color film on the new EHD Faultmaster cutout is available for viewing from Hubbard & Co., 200 S. Michigan Ave., Chicago 4, Ill. Write to the company's advertising department.

(30) EXPLOSIONPROOF FIXTURES — Appleton Electric Co. has published an eight-page four-color catalog on its AA-51 series explosionproof incandescent and mercury vapor lighting fixtures. Ask for your copy of Form 303. The address is Appleton Electric Co., 1701 Wellington Ave., Chicago 13, Ill.

(31) POCKET CATALOG—A handy pocket-sized catalog giving pricing data on all products available from distributor stocks has been issued by Federal Pacific Electric Co. Write to the company, Dept. 303, 50 Paris St., Newark 1, N. J. Ask for Pocket Federalog 111-PR.

(32) SUSPENSION DATA—Detailed technical information on Preformed Line Products Co.'s armor-grip suspension is carried in a 24-page booklet entitled "Detailed Technical Information." It is part of a new data folio that has four different bulletins related to armor-grip suspension. Write to the company's Sales Promotion Office, 5349 St. Clair Ave., Cleveland 3, Ohio. Ask for the Data Folio.

KILL TWO BIRDS WITH ONE STONE—Fill out this coupon and get back valuable information from as many sources as you indicate.

ELECTRICAL WEST
68 Post St., San Francisco 4, Calif.

Not good after May 1

Please send me, without obligation, the new product information or catalogs:

If described in Product News, circle item number

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

If described in advertising, fill in page number

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

NAME..... TITLE

COMPANY

ADDRESS

CITY..... ZONE..... STATE.....

*Please include your company's name and your position, as we cannot ask manufacturers to furnish literature unless you do.

FAST, Lightweight

Greenlee Hydraulic Benders for 1/2" - 4" Conduit

full 90° bend with one ram stroke

NEW GREENLEE NO. 883 Lightweight Hydraulic Conduit Bender quickly makes accurate bends in conduit ½" through 3" . . . up to 90° with one ram stroke. Operates with either a portable power pump or hand pump. Makes 90° bend in 3" conduit in approximately one minute with power pump . . . only 10 minutes with hand pump.

One set of rotating supports for all eight conduit sizes. Conduit is easily inserted and removed from front of bender. "Quick-removal," positive-locking support pins cannot come loose when ram pressure is applied.

Get details now on the complete GREENLEE Lightweight Bender line that includes three models for ½" - 2", ½" - 3", and ½" - 4" conduit.

new ratchet bender for ½", ¾", 1" conduit

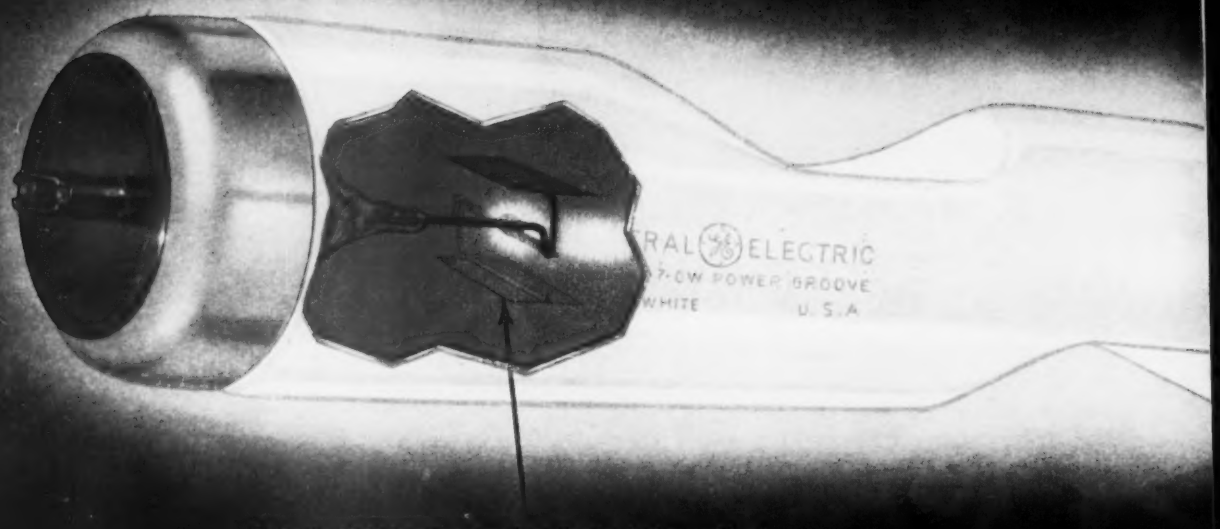
Ratchet action permits short, powerful strokes, for quick, easy bending up to 90°. Swing-away clamp makes loading simple. Sturdy T-iron base sets anywhere or receives threaded pipe legs of any desired length.

A COMPLETE LINE OF HYDRAULIC AND HAND BENDERS FOR CONDUIT, TUBING

GREENLEE TOOL CO.
1764 Columbia Ave.
Rockford, Illinois

GREENLEE

NOW! THE MOST POWERFUL



Cathode shield improves anode action (reducing end loss) and collects tiny electrode particles that would otherwise land on glass wall, darkening end of tube. New G-E Power Groove stays brighter...end-to-end...longer!

NEW G-E POWER GROOVE LAMP...

- Gives most users lowest cost of fluorescent light...
- Saves them 10-30% on initial investment alone
- Stays cleaner, brighter longer—no darkened ends
- Will last about 3 years in single-shift service

The new Power Groove is the most recent advance in lighting from G. E., *your most consistent source for new and improved lamps* to give your customers more for all their lighting costs. If they are planning a new building, or remodeling an existing one, this dramatic improvement in lighting deserves first consideration.

LOWER CAPITAL INVESTMENT. That's the most exciting aspect of this new lamp. It costs no more than the original General Electric Power Groove, yet with all this light you can now plan on—*and deliver*—a higher level of lighting than was ever practical before. And the investment in lamps and distribution equipment is *even more* practical and economical!

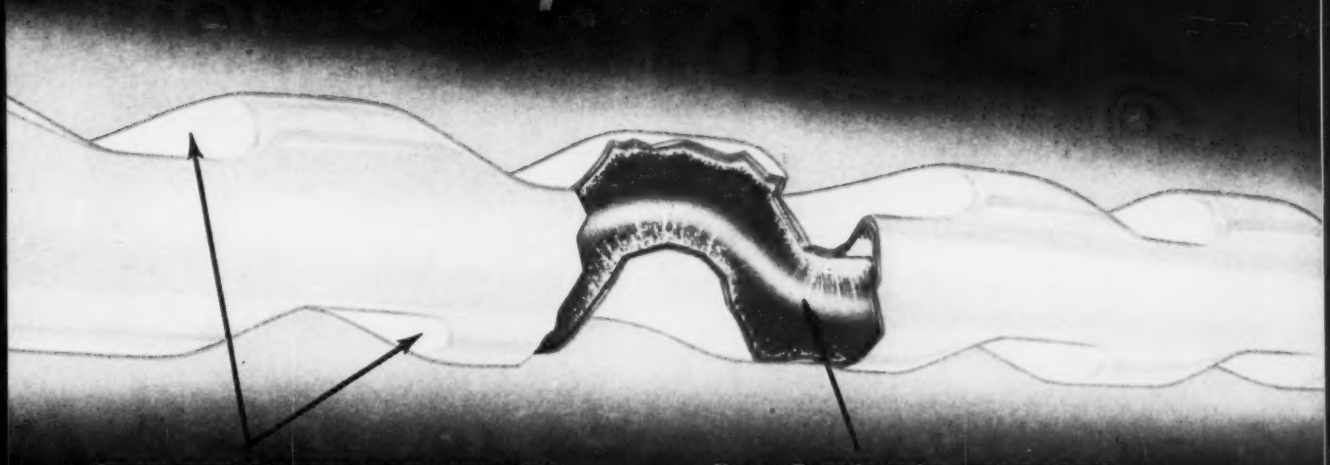
IMAGINE! A single 8-foot G-E Power Groove can deliver a startling 15,000 lumens—the highest light output obtainable from any fluorescent lamp available today. This gives users the lowest cost of fluorescent light for most new lighting systems, and establishes a new set of standards in overall lighting economy.

LIGHT OUTPUT STAYS HIGH. General Electric's efficient cathode shield reduces cathode wattage losses...and also collects the tiny electrode particles that would otherwise be deposited on the glass wall, darkening the lamp ends. General Electric Power Grooves now stay brighter . . . end-to-end . . . longer!

As your customers build or expand, increase your own profits by recommending the economy of the new G-E Power Groove Lamps for their general lighting. For more information, call your nearby G-E Large Lamp Distributor, or write: General Electric Co., Large Lamp Dept. C-913, Nela Park, Cleveland 12, Ohio.

FLUORESCENT YOU CAN BUY!

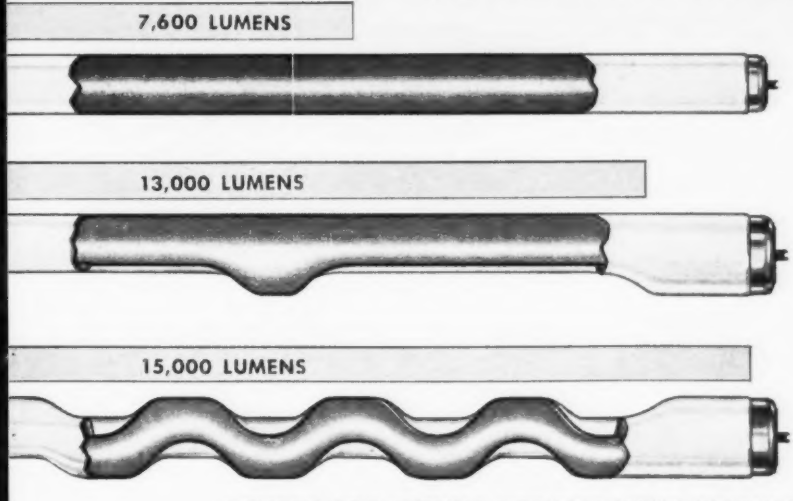
RATED LIGHT OUTPUT 15,000 LUMENS



Grooves or panels "squeeze" arc to increase light-producing power, give you same strength with thinner glass. They also aid light emission, enabling you to use more of total light given off by phosphor.

New configuration makes arc stream travel in a wavy path, makes greater electric power available for producing light. You get the arc equivalent of a 9-foot lamp!

THE SECRET'S IN THE SHAPE



REGULAR FLUORESCENT, shown here in the conventional round shape of the High Output Lamp, has a straight arc stream. As in the case of *any* fluorescent, this arc causes mercury vapor to radiate energy which excites phosphor on inside wall. This, in turn, gives off light.

ORIGINAL POWER GROOVE, developed by General Electric in 1956, has an interrupted groove along one side, continuous except for bridging at regular intervals to increase glass strength. Grooves or panels "squeeze" the arc to increase the light-producing power.

NEW POWER GROOVE has grooves on both sides to accomplish same "squeezing" effect. In addition, it makes arc travel in wavy path—a full foot longer in 8-foot tube! This gives you even *more* light-producing power. New shape also enables you to use more of the total light given off by the phosphor.

LONGER ARC STREAM, GREATER LIGHT-PRODUCING POWER GIVE YOU
A NEW LOW IN COST-OF-FLUORESCENT-LIGHT FOR MOST INSTALLATIONS

Progress Is Our Most Important Product

GENERAL ELECTRIC

DEAD END WITH

BLACKBURN

W6-2A from 6 Sol to 2 ACSR
This Clamp Will Handle All
Popular Service Drop Wires

WEDGE CLAMPS

For Light Service
W6-4A
6 Sol to 4 ACSR

For Heavy Service
W2-OA
2 Sol to 1/0 ACSR

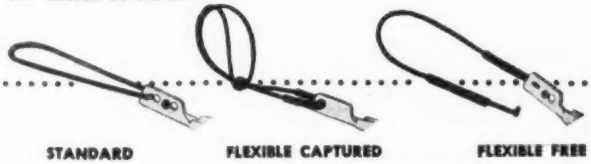
Conductor in contact with wedge for entire length of slider.

Removable aluminum slider allows installation without threading through clamp.

Drop wire can be pre-sagged and cut to exact length needed.

Can be attached to bare neutral at any point in the span.

Your Choice of 3 Bails

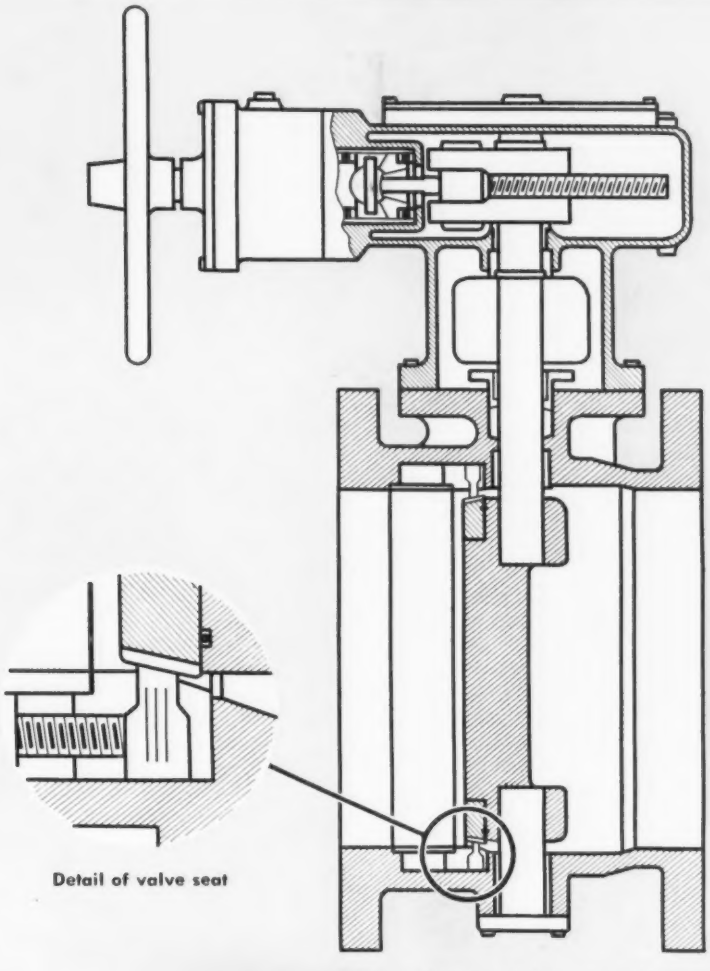


STANDARD FLEXIBLE CAPTURED FLEXIBLE FREE

JASPER
BLACKBURN
CORPORATION

1525 WOODSON RD., ST. LOUIS 14, MO., WYdown 3-9430

Get longer life and trouble-free performance with Pelton rubber-seated butterfly valves



Pelton rubber-seated butterfly valves are available with hydraulic cylinder, manual operator, or Pelton motor operator.

A 6-in. test valve under 50 psi with a flow corresponding to a 16 fps velocity in the adjacent 6-in. pipe was recently operated through 12,500 cycles (10,000 with rubber seat ring downstream of valve operating shaft, 2500 with it upstream). Periodic checks at frequent intervals revealed that the valve was absolutely droptight throughout the entire test. Similar tests conducted under 125 psi demonstrated equally outstanding performance of these butterfly valves.

Manufactured in strict accordance with AWWA standards, Pelton rubber-seated butterfly valves offer the following significant advantages:

- **Compactness**
- **Ease of operation**
- **Low maintenance**
- **Greater net flow area (lower head losses than for comparable size valves)**

In addition to butterfly valves, Pelton manufactures impulse turbines, reaction type turbines, hydraulic turbine governors, spherical valves, pressure regulators, surge suppressors, waterworks valves, large centrifugal pumps, duplex strainers, dynamic balancers, etc. For descriptive illustrated bulletins, write Pelton Division (B-L-H), 2929 Nineteenth Street, San Francisco 10, Calif., or Eddystone Division (B-L-H), Philadelphia 42, Pa.

Pelton Division San Francisco, Calif.

BALDWIN • LIMA • HAMILTON

Hydraulic turbines • Valves • Governors • Centrifugal pumps

BALDWIN BLH LIMA-HAMILTON

AGS* gets right to the

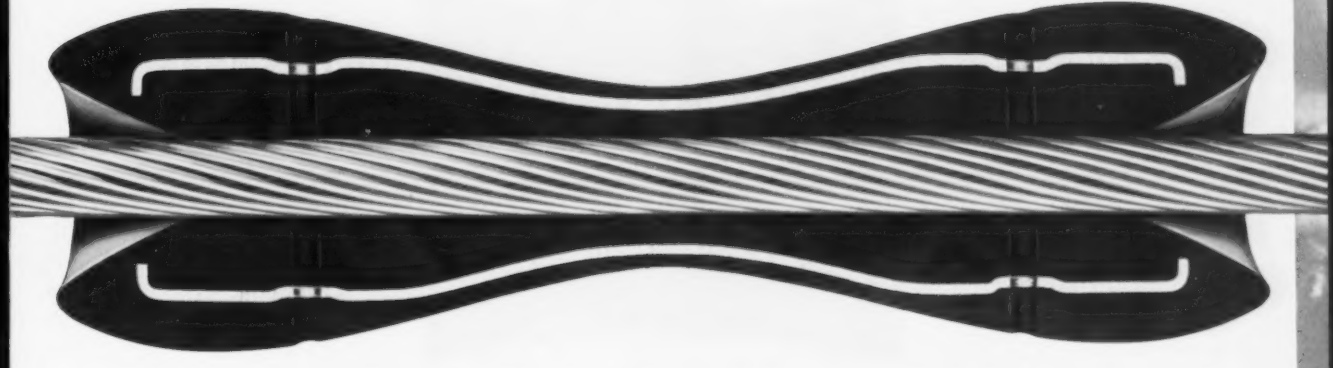
Comprehensive new folio tells how and why AGS* eliminates line failures.

Send for your copy:

PREFORMED LINE PRODUCTS COMPANY
DEPT. A
5349 St. Clair Ave. • Cleveland 3, Ohio

CORE of line failure

nothing could be easier

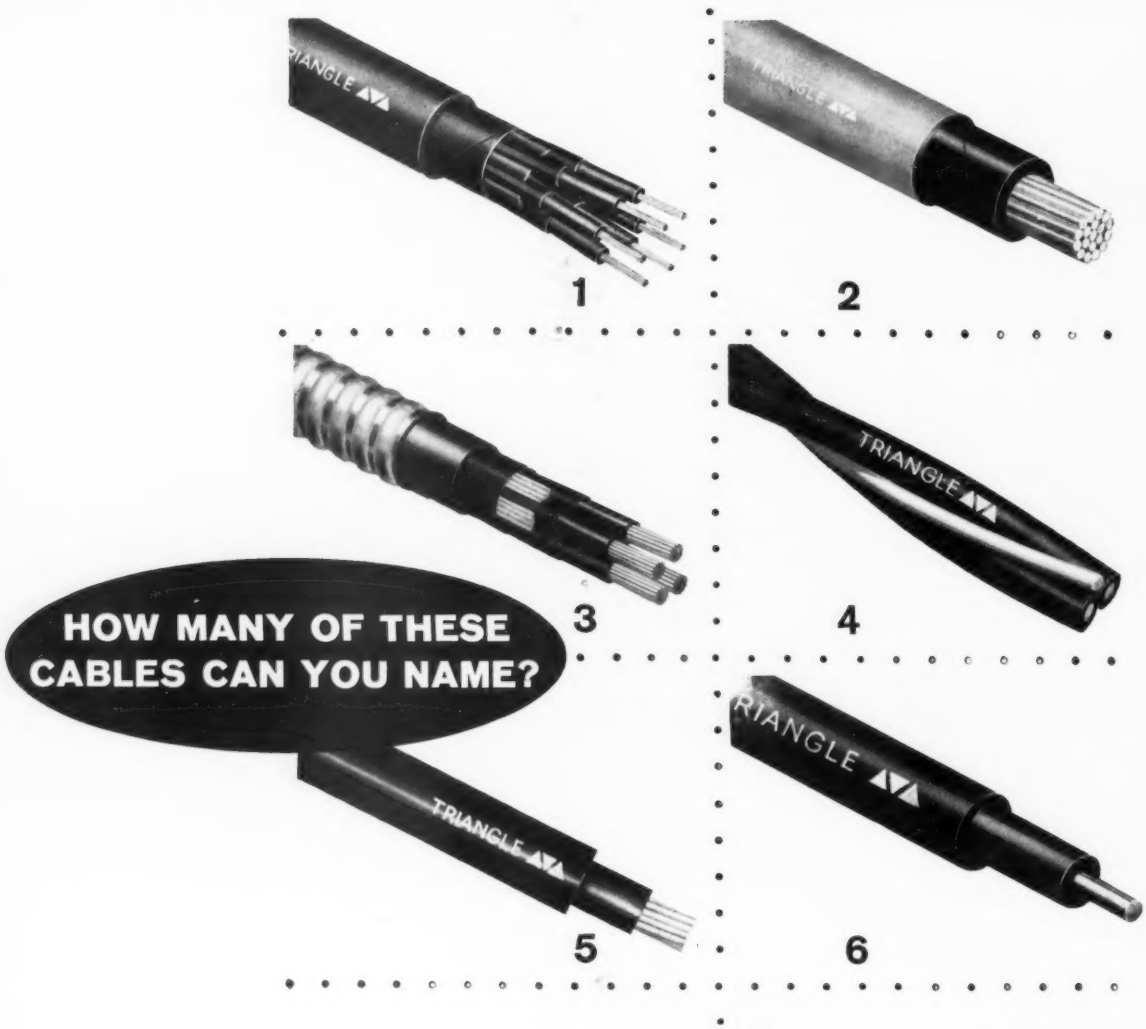


(on a vibrating conductor)

than the exclusive reinforced neoprene cushion inside the Preformed Armor-Grip* Suspension... AGS*

You can look up to **Preformed***

Trade mark* Patented — U. S. Patent No. 2,722,393



These six are only a few of the many types in the Triangle line of Power, Control and Lighting Cables for utilities. How many can you name without peeking at the bottom of the page?

You've probably specified these types many times — more and more utility engineers are doing that these days. They've become convinced that Triangle, a long time leader in the building wire and conduit field, can and does turn out control, network and service drop cables of the same high quality. Triangle products "must be right"—they must meet all specifications with plenty to spare.

Why don't you find out more about these and other cables in the broad Triangle line. Write for complete literature which is available to answer your specific inquiry.

TRIANGLE CONDUIT & CABLE CO., INC.

NEW BRUNSWICK, NEW JERSEY

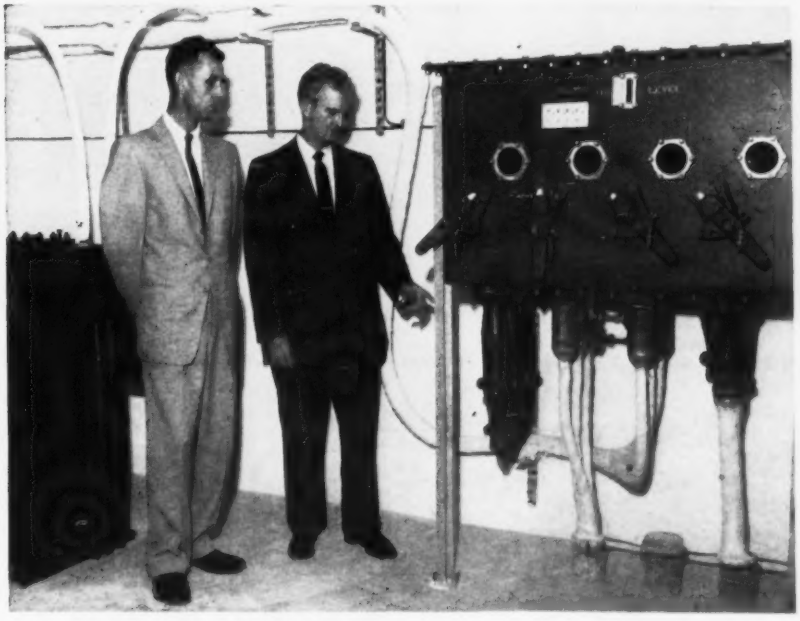
"It MUST Be Right!"

1 Control Cable 2 Varnished Cambric Lead Covered Power Cable 3 Interlocked Armor Power Cable 4 Neutral Supported Secondary Network Cable (Triplex) 5 RR Cable 6 Series Street Lighting Cable

PORT OF SAN DIEGO UNDERGROUND DISTRIBUTION SYSTEM PLANNED FOR FLEXIBLE, DEPENDABLE SERVICE AND EASE OF EXPANSION

Continuity of power service at the Port of San Diego 10th Ave. Terminal is a "must." An extensive array of material handling equipment will serve the warehouse as well as rail and truck transportation required to load and unload nine ocean-going freighters simultaneously. Adequate provisions have been made to maintain continuous electrical service for the 2600-foot wharf even when the need occurs for expanding its present facilities.

Sound planning included two lines of service to each transformer through the use of twenty-six submersible G&W 3-pole, 15 kv, 400 ampere load break oil switches. Two types were used. The Type RAL is a 3-way unit serving the function of three separate switches—1) a loop-through, 2) an isolating and 3) a double throw switch. The Type RAM is a 4-way unit that permits variable combinations of feeders and loads by tying to the switch bus through individual load break disconnects. Stud bushing compartments on the switches make system expansion possible without interruption of power service. There is a G&W load break oil switch to solve your problem. A G&W representative will be glad to tell you about them or send for the new switch folder for additional information.



J. E. Liebmann, Harbor Engr. (left) and Willis Lipscomb, Design Engr., point out stud bushing compartments on G&W Type RAM switch. These compartments permit connection of additional cables without taking the switch out of service, thus avoiding an outage.

G&W ELECTRIC SPECIALTY COMPANY

3506 West 127th Street, Blue Island, Illinois

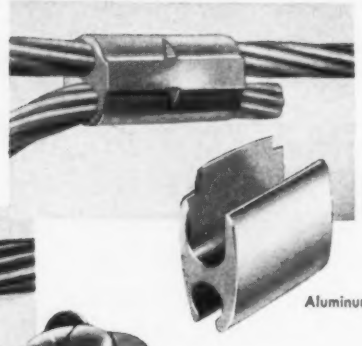
Representatives in principal cities • Canadian Mfr.—Powerlite Devices, Ltd., Toronto

G&W

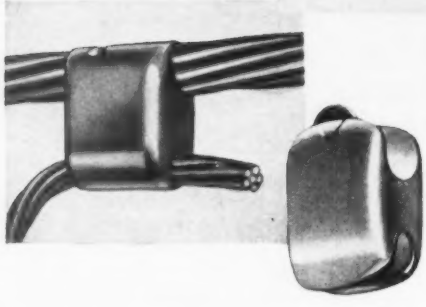
KEARNEY

today's

~~tomorrow's~~ loads demand

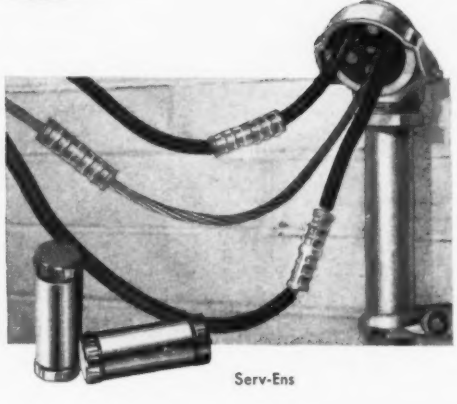


Aluminum Squeezons

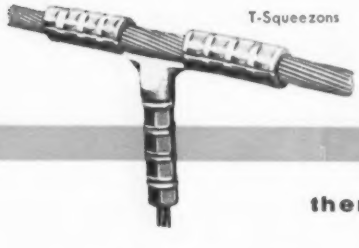


Copper Squeezons

Tension Splicing Sleeves
and Jumper Sleeves



Serv-Ens



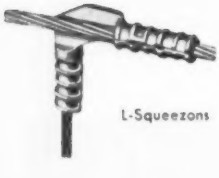
T-Squeezons

there's a KEARNEY compression fitting for almost every

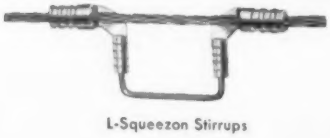
Insulated Splices

Bolted Jumper Sleeves

Compression
Terminals



L-Squeezons



L-Squeezon Stirrups

Ground Rod Fittings

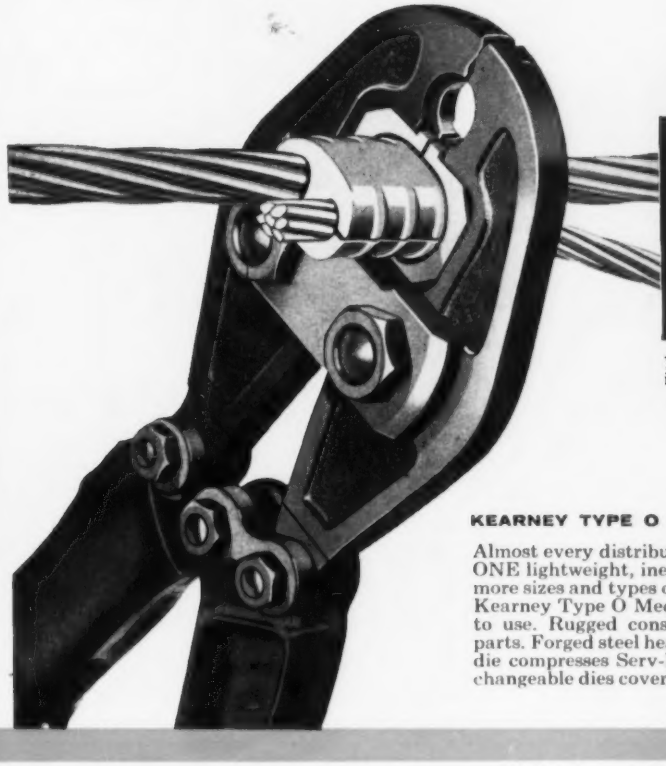
Ground Lugs

for better construction – safer maintenance –

KEARNEY compression fittings

Solve distribution system connection problems with Kearney Compression Fittings . . . get lasting, dependable connection performance under the most rugged operating conditions. Kearney Compression Fittings assure uniformly correct contact pressure, eliminate burndowns and insure extra-long connection life in severely contaminated atmosphere. They prevent contact surface corrosion, eliminate loose or unreliable connections . . . reduce costs. Consider the advantages and economy of Kearney Compression Fittings; write or ask our field representative for more information.

...applied with KEARNEY compression tools



Dies may be easily snapped in or out with fingers only

Kearney WH-1 Hydraulic Tool

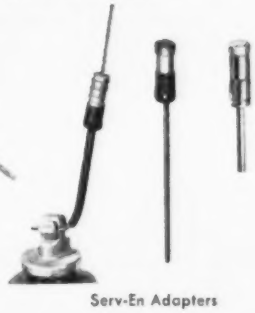
Fast . . . powerful . . . easy to use. From wide open dies to full compression in less than 20 strokes. Twist of the wrist retracts die or sets tool to make compression. Narrow head for full visibility of work area. Balanced weight for easy positioning. Interchangeable handles available for hot line work.

KEARNEY TYPE O MECHANICAL TOOL

Almost every distribution connection can be made with this ONE lightweight, inexpensive tool. In addition to installing more sizes and types of fittings than tools with fixed dies, the Kearney Type O Mechanical Tool is faster, easier and safer to use. Rugged construction throughout—no complicated parts. Forged steel head, heat treated for high strength. Nose die compresses Serv-Ens and L-Squeezons. Fourteen interchangeable dies cover a wide range of connection fitting jobs.

connection requirement

Compression Deadends



Serv-En Adapters

these 3 easy steps insure trouble-free electrical connections:

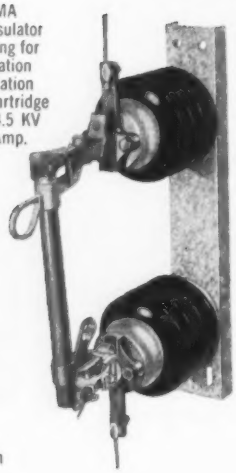
1. Use Kearney Conductor Cleaning Brush to remove corrosion.
2. Apply Kearnalex to aluminum contact surfaces immediately after cleaning to exclude air and moisture . . . maintain maximum efficiency contacts.
3. Seal the connection against moisture and contaminants with Kearney Airseal.

specify KEARNEY compression tools and fittings

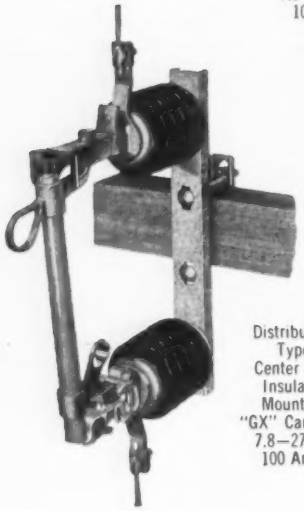
KEARNEY

KEARNEY "G" and "GX"

TYPE GX
Tripout
Fuse Cutout
7.8—27 KV
100 Amp.



NEMA
Post Insulator
Mounting for
Substation
Installation
"GX" Cartridge
7.8—34.5 KV
100 Amp.

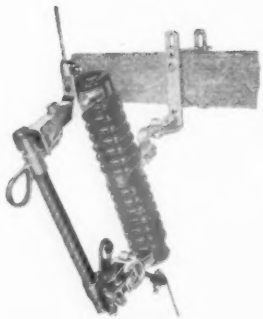


Distribution
Type
Center Bolt
Insulator
Mounting
"GX" Cartridge
7.8—27 KV
100 Amp.

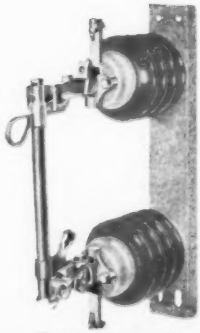
Type "GX" Cartridges vent at bottom only on low-amperage faults . . . at both ends on high fault currents. Both vents are in line with axis of tube, reducing shock recoil to a minimum. On high amperage faults, top venting action blows small disk out of expendable cap to safely relieve gas pressure.

UPDATE YOUR OLDER CUTOUTS WITH KEARNEY CONVERSION UNITS

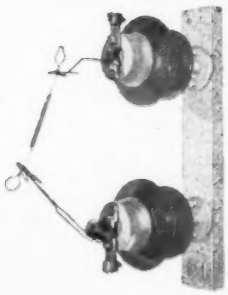
These modern current-carrying parts install on existing mountings to give you all of the outstanding features and performance of the newest Kearney Cutouts—positive dropout action, higher interrupting capacity, and extra strength fuse tubes.



Type G 5.2-15 KV
Type GX 7.8-15 KV



Type G and Type GX
7.8-34.5 KV



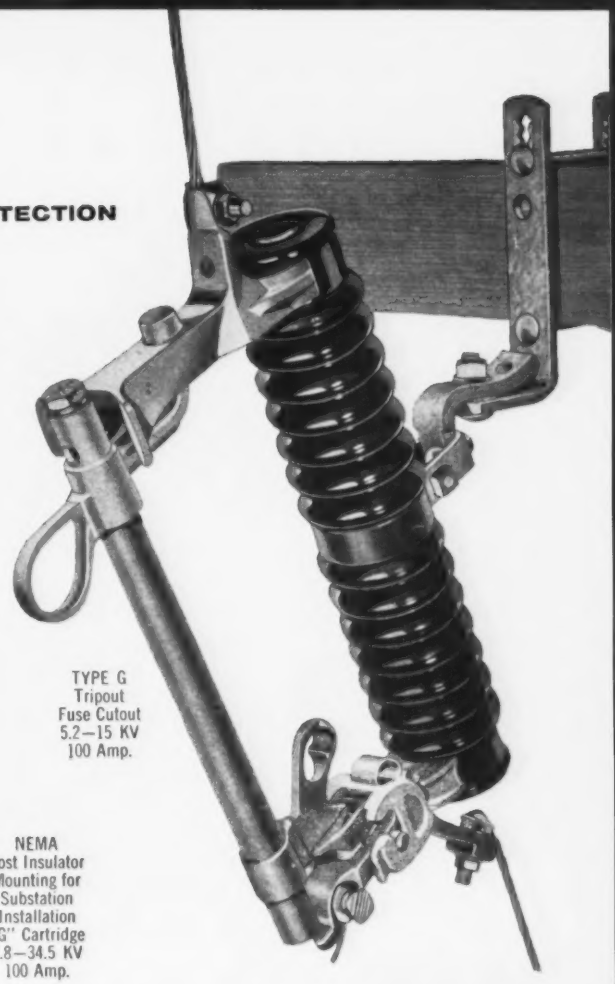
Trip-O-Link 50 Amp.
23-69 KV

for better construction - safer maintenance - specify KEARNEY products

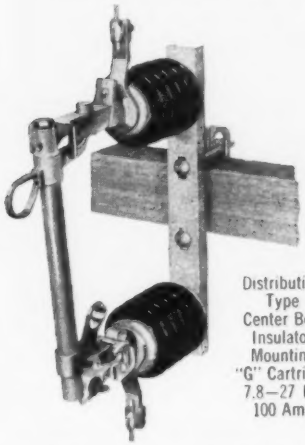
cutouts...

FOR DEPENDABLE, MODERN SYSTEM PROTECTION

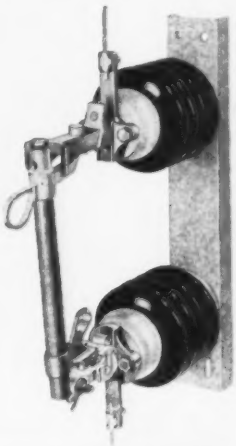
Kearney Type "G" and "GX" Tripouts assure the highest level of operating dependability and economy for full range distribution system protection. Both interrupt fault currents ranging from minimum melting of the link to maximum rating of the cutout with any size button head link up to 100 amperes. A choice of venting is offered by two cartridge types, interchangeable in the same voltage ratings. Full-time double venting is provided by the "G"... and pressure-controlled double venting by the "GX." These two cartridges, and a wide range of interrupting ratings, voltages and mountings meet every operating requirement.



TYPE G
Tripout
Fuse Cutout
5.2—15 KV
100 Amp.



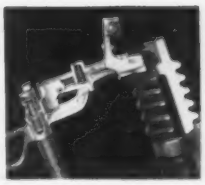
Distribution
Type
Center Bolt
Insulator
Mounting
"G" Cartridge
7.8—27 KV
100 Amp.

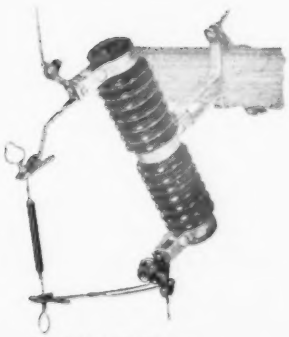


NEMA
Post Insulator
Mounting for
Substation
Installation
"G" Cartridge
7.8—34.5 KV
100 Amp.

Front vent directs expulsion gases away from line equipment. Gas pressure from top jet keeps cartridge in place and upper contacts closed until arc is extinguished. Size of top vent in double vented cartridge allows build-up of ample pressure to extinguish low amperage arcs, yet enables cartridge to withstand gas force of high current faults without rupturing.

Heart of Type "G" construction is this full-floating constantly aligned upper contact, which cannot be misaligned by high current interruption or extreme side thrust during closing. During interruption, force of cartridge thrust is absorbed by full-floating contact until arc is extinguished and cartridge drops out.

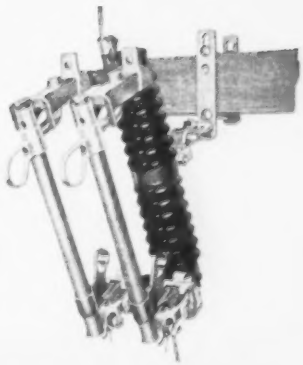




Trip-O-Link 50-100 Amp.
5.2-15 KV

KEARNEY DUAL CARTRIDGE LOAD INTERRUPTER

Safe, positive way to interrupt load current. For full load sectionalizing or dropping transformer or capacitor banks. Current is interrupted electrically, not mechanically. During operation, one cartridge, fused for load protection, is closed in; the other, the interrupter, fused with a low amperage link, remains open. Later this cartridge is closed in, and service cartridge pulled out. After predetermined time delay, small link blows, interrupting current safely within interrupter cartridge.



JAMES R. KEARNEY CORPORATION

GENERAL OFFICES: 4224-42 CLAYTON AVE. • ST. LOUIS 10, MISSOURI

IN THE WEST: for prompt service, contact Kearney's West Coast Distributor, Maydwell and Hartzell, Inc., Los Angeles • Seattle • Portland • San Francisco • Spokane • Phoenix

Plants at: ST. LOUIS • FAYETTEVILLE, ARKANSAS • SHENANDOAH & CLARINDA, IOWA • GUELPH, ONTARIO, CANADA

-specify KEARNEY products

DEVELOPED TO MEET YOUR NEEDS:

400/800 ampere
Dual Range
CURRENT TRANSFORMER

This new dual range transformer was developed to meet *your* needs. It combines greatly extended range with all these other features of BH-6 Transformers:

OVAL SHAPED WINDOW for greatest flexibility in application with the greatest usable opening of any 600 volt current transformer.

COMPACT DESIGN makes it easy to mount. It's the smallest, lightest transformer in its class.

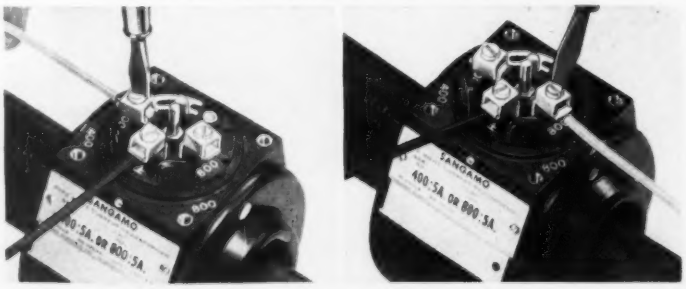
COLOR CODING . . . BH-6 Transformers are color coded in standard resistor colors for quick identification. (The new 400/800 rating is molded in black.)

CERTIFICATION OF ACCURACY . . . A certificate of accuracy test is supplied with all Sangamo current transformers. They arrive ready for you to put on the line.

you asked for it... a 400/800 ampere rating in a BH-6 Current Transformer that could provide extended capacity for future growth after initial installation on the 400 ampere range. By using one or more primary turns, this one transformer can be used on loads ranging from 40 to 1600 amperes.

Now, you can drastically lower your transformer stock levels, sharply reduce expensive changeouts, and get 0.3 accuracy class on all loads from 40 to 1600 amperes.

DUAL RANGE FEATURE:



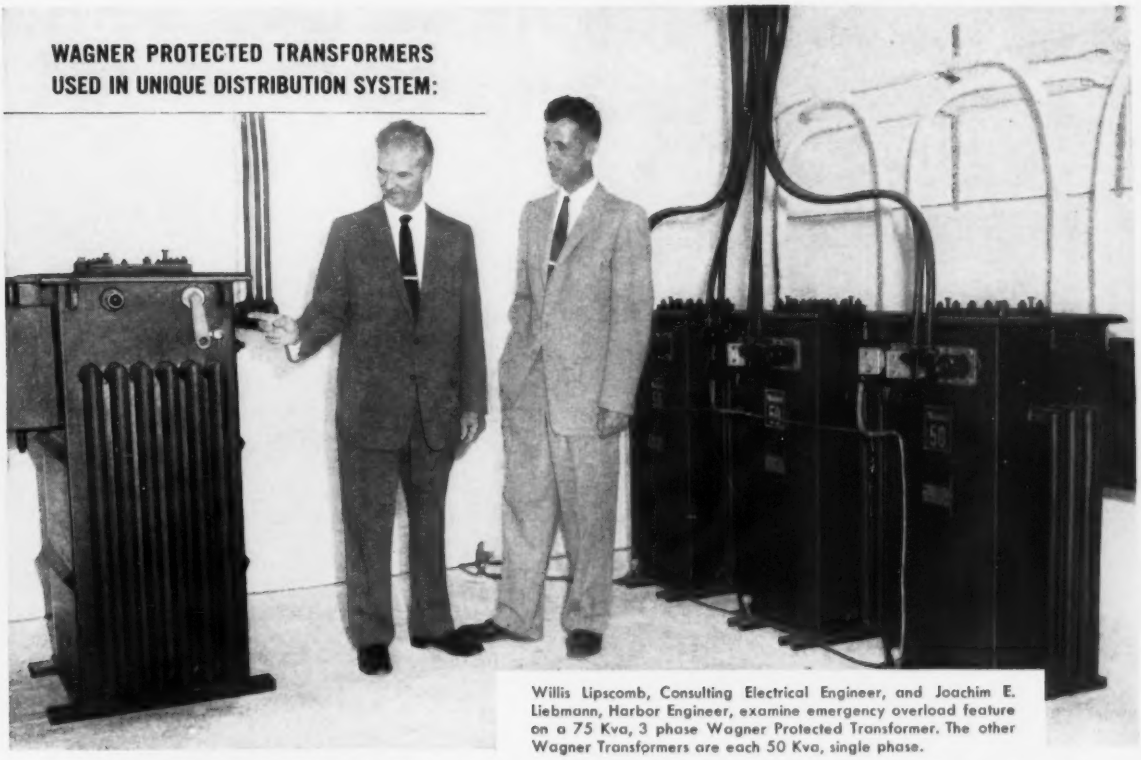
Changing range is as simple as 1-2-3. First, close the short circuiting link. Second, transfer the secondary lead from the 400 to the 800 amp terminal. Third, open the short circuiting link.

SM59-2

SANGAMO *Electric Company*
SPRINGFIELD, ILLINOIS

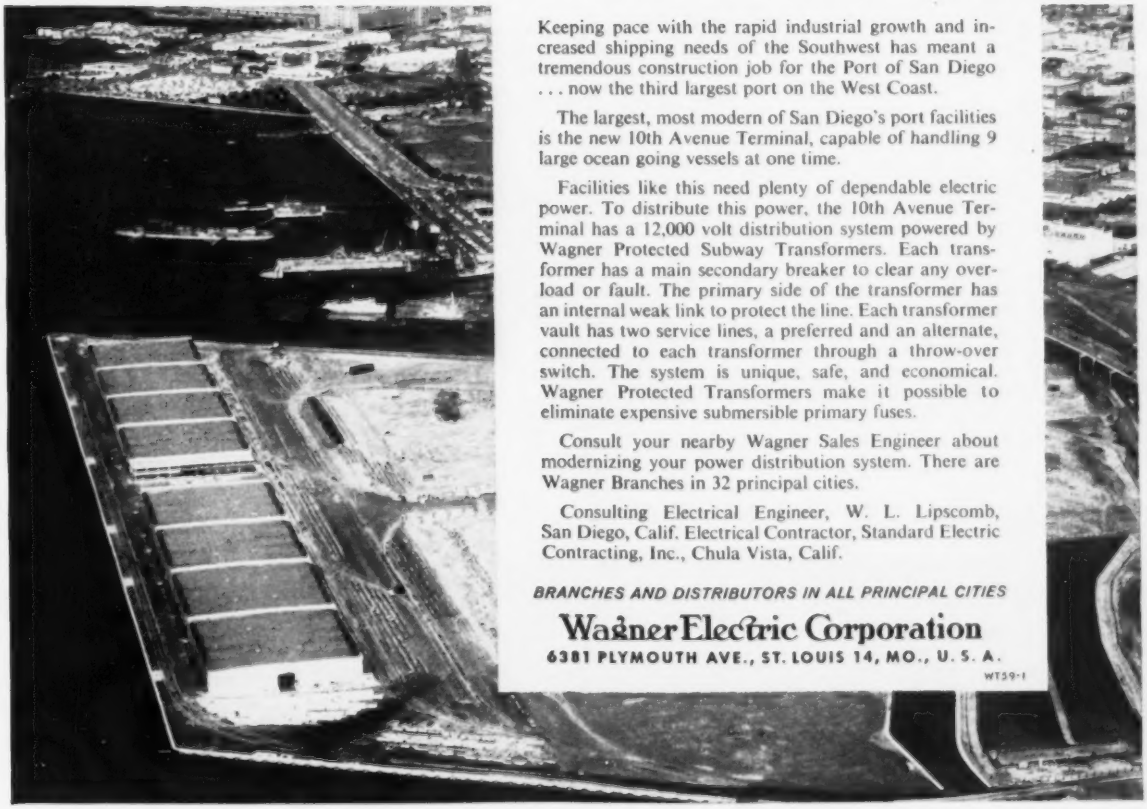
Los Angeles • Seattle • Portland • San Francisco • Spokane • Phoenix
Plants at: ST. LOUIS • FAYETTEVILLE, ARKANSAS • SHENANDOAH & CLARINDA, IOWA • GUELPH, ONTARIO, CANADA

WAGNER PROTECTED TRANSFORMERS USED IN UNIQUE DISTRIBUTION SYSTEM:



Willis Lipscomb, Consulting Electrical Engineer, and Joachim E. Liebmann, Harbor Engineer, examine emergency overload feature on a 75 Kva, 3 phase Wagner Protected Transformer. The other Wagner Transformers are each 50 Kva, single phase.

POWER for the Port of San Diego



Keeping pace with the rapid industrial growth and increased shipping needs of the Southwest has meant a tremendous construction job for the Port of San Diego . . . now the third largest port on the West Coast.

The largest, most modern of San Diego's port facilities is the new 10th Avenue Terminal, capable of handling 9 large ocean going vessels at one time.

Facilities like this need plenty of dependable electric power. To distribute this power, the 10th Avenue Terminal has a 12,000 volt distribution system powered by Wagner Protected Subway Transformers. Each transformer has a main secondary breaker to clear any overload or fault. The primary side of the transformer has an internal weak link to protect the line. Each transformer vault has two service lines, a preferred and an alternate, connected to each transformer through a throw-over switch. The system is unique, safe, and economical. Wagner Protected Transformers make it possible to eliminate expensive submersible primary fuses.

Consult your nearby Wagner Sales Engineer about modernizing your power distribution system. There are Wagner Branches in 32 principal cities.

Consulting Electrical Engineer, W. L. Lipscomb, San Diego, Calif. Electrical Contractor, Standard Electric Contracting, Inc., Chula Vista, Calif.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

Wagner Electric Corporation

6381 PLYMOUTH AVE., ST. LOUIS 14, MO., U. S. A.

WT59-1

If you want to be sure install Tiger Brand

Cable is pulled through the racks. Pulleys ease it through at each turn.

SINCE we've been making electrical cable at American Steel & Wire since 1891, customers often ask us how they can best plan for *future* wiring needs. They've seen the shocking cost of plant modernization programs in buildings that were not designed with foresight.

Electrically speaking, you're going to need a *flexible* wiring system, one that can be enlarged or revamped with ease. To lots of designers today, that means a feeder system that is *not* permanently sealed in rigid conduit, frequently buried under tons of concrete and, in case of damage, frequently unrepairable. All of these problems are solved when you install flexible Armorlokt in an open-rack system.

Initial installation is not difficult. Extra feeders can be added easily at any time. Special feature: Splices can be made *anywhere* along the cable's length. The pictures on these pages show how adaptable and flexible such a wiring system can be.

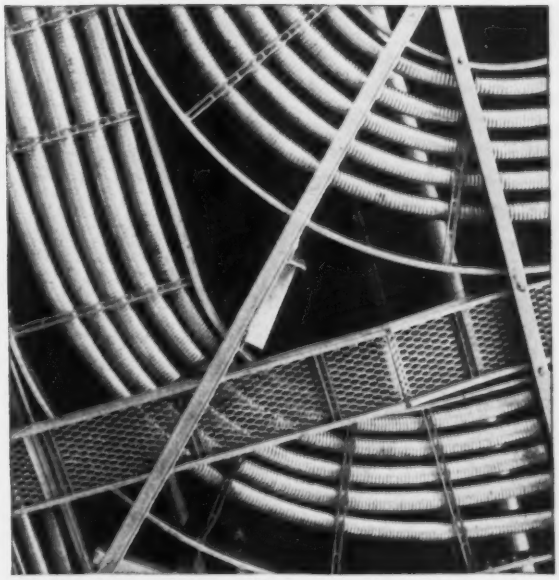
Tiger Brand Armorlokt is made in a complete range of sizes and constructions. Ask your AS&W salesman. American Steel & Wire. Gen'l Offices: 614 Superior Ave., N.W., Cleveland 13, O.

USS American Steel & Wire Division of United States Steel

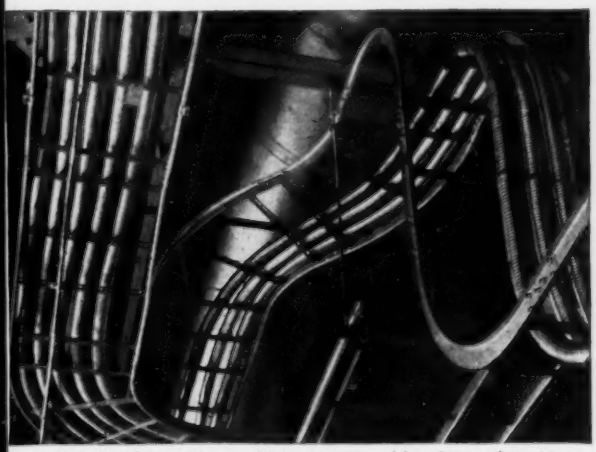
Winch on truck does the pulling. Crew members talk to each other with telephones.

# of adequate wiring in 1979, Armorlokt now!

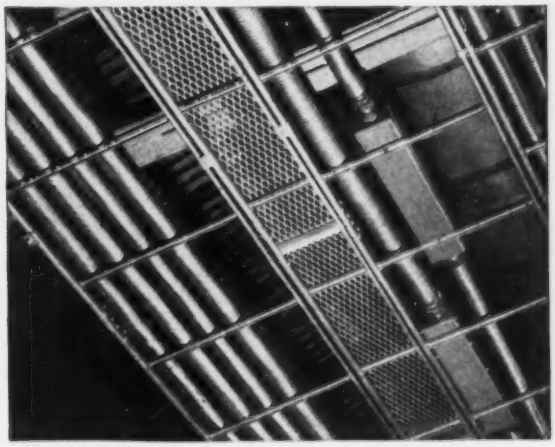
Armorlokt terminates easily. Flexibility of the cable eliminates fussy joint work.



Small radius or large radius curves are easily handled. Space is left for future cable.



Imagine how this would look using old-style conduit. Now it's neat and accessible.



Splices can be made anywhere, an important feature if cable is damaged in service.

USS

Tiger Brand Electrical Wire & Cable

A standard cable for every special job

- Asbestos Wire and Cable
- Mold Cured Portable Cord
- Shovel & Dredge Cable
- Paper & Lead Cable
- Varnished Cambric Cable
- Interlocked Armor Cable
- Special Purpose Wire & Cable
- Aerial, Underground and Submarine Cable

USS, Tiger Brand and Armorlokt are trademarks

ALLIS-CHALMERS ACQUIRES S. MORGAN SMITH ...FORMS NEW HYDRAULIC DIVISION

On February 1, the S. Morgan Smith Company became a part of Allis-Chalmers. Extensive A-C facilities in Milwaukee, together with two S. Morgan Smith plants in York, Pennsylvania, are now operating as the newly created Allis-Chalmers Hydraulic Division.

In acquiring S. Morgan Smith, A-C combines its own broad background in hydraulics with the 80 years of diversified engineering and manufacturing knowledge of SMS.

The York facilities will be devoted to the continued research, design, engineering and fabrication of a complete line of hydraulic turbines and accessories, pumps and pump-turbines, valves for industrial, waterworks and power applications, and specialized heavy equipment.

Product information or engineering help can be obtained from your nearby Allis-Chalmers office, or by writing Allis-Chalmers, Hydraulic Division, York, Pennsylvania.

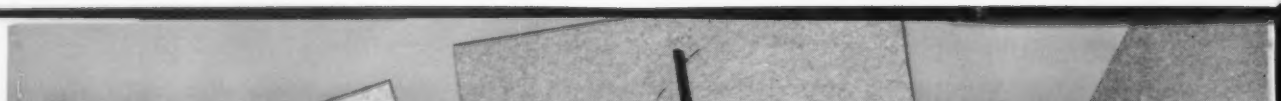
HYDRAULIC DIVISION

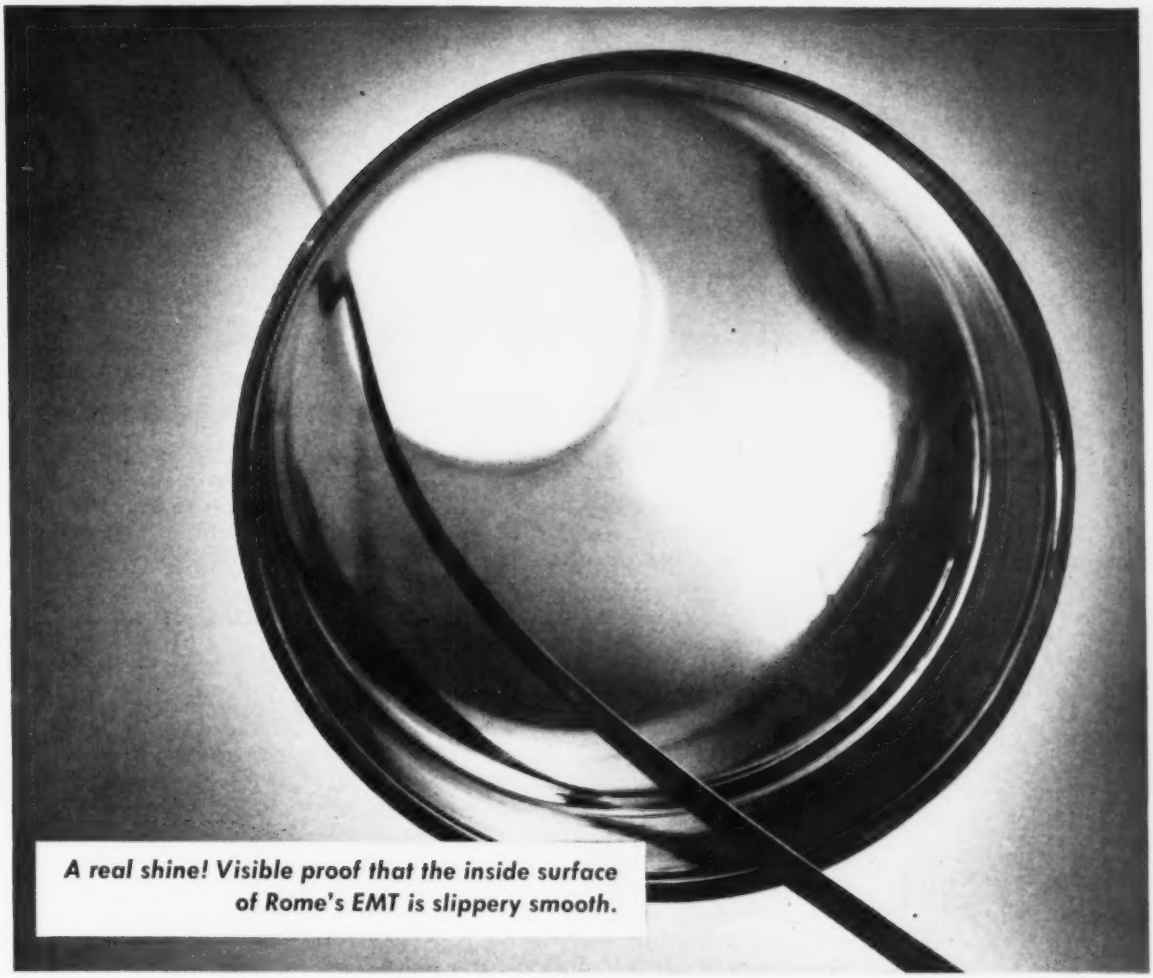
RESEARCH | DESIGN
HYDRODYNAMICS
ENGINEERING | FABRICATION

Rotovalves • Ball Valves • R-S Butterfly Valves • Free-Discharge Valves • Liquid Heaters • Pumps • Hydraulic Turbines & Accessories

A-C ALLIS-CHALMERS

ALLIS-CHALMERS





A real shine! Visible proof that the inside surface of Rome's EMT is slippery smooth.

"Tape's eye view" shows why Rome's EMT is easiest to fish

That shine you see is the reason fish tape won't "hang up" when you use Rome's EMT.

The slick interior finish of Rome's EMT lets your fish tape slide through with an absolute minimum of resistance. Careful baking—under rigid control—produces a uniformly smooth enamel-like finish inside Rome's EMT.

In a test conducted by the Anstice Company, a completely unbiased party, Rome's EMT came out first in fishability. Three ten-foot lengths of ½" EMT, Rome's and two competitive samples, were formed into identical figures containing eight bends. The ¼" fish tape used in the test easily passed through the eight bends in Rome's EMT, but "hung up" on one of the bends in both competitive samples.

Strong weld In another test to determine the strength of the weld on Rome's EMT, a sample was squeezed, flared, flattened, and expanded. In each case, the weld proved to be as strong as the metal itself.

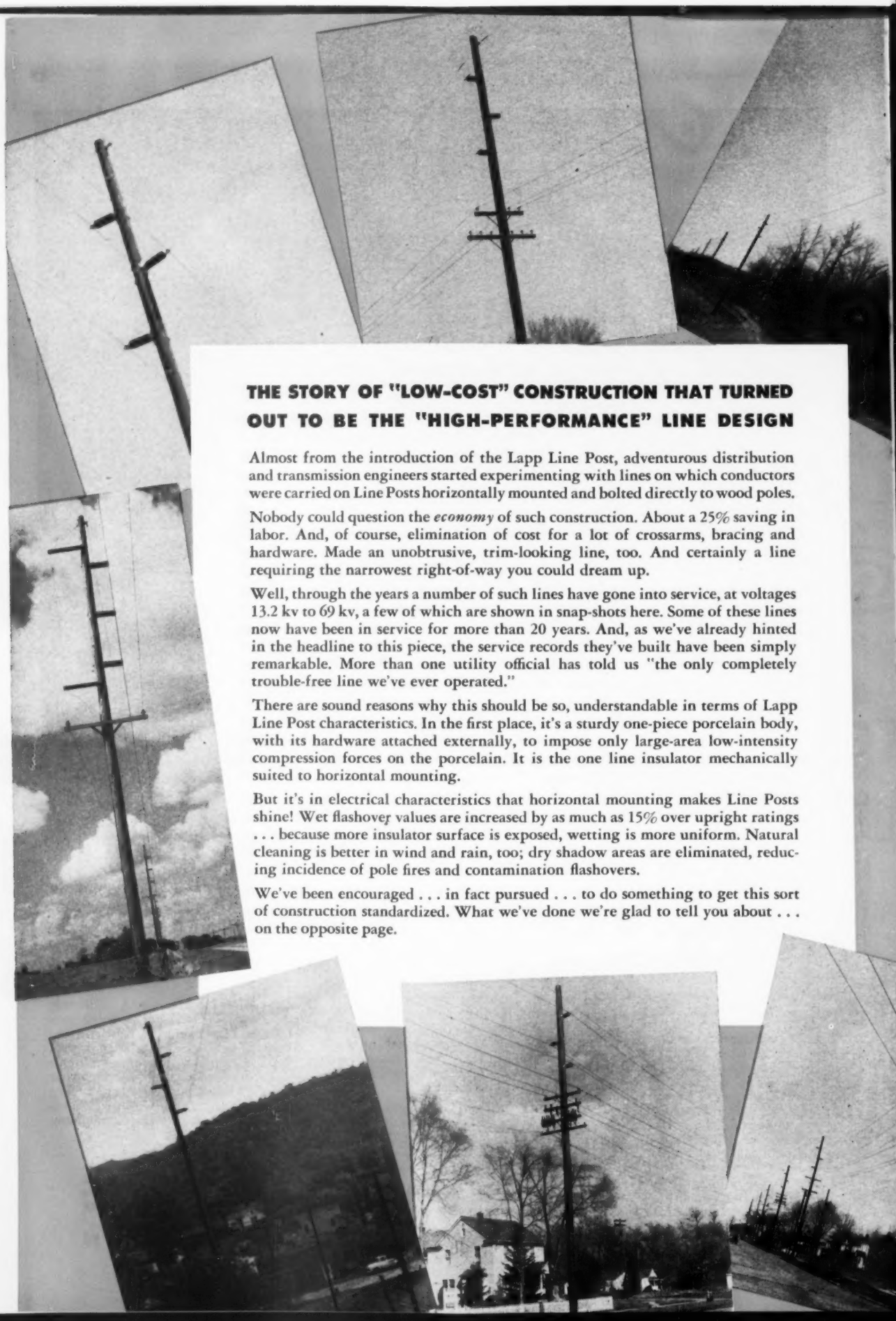
Easy bending The strength of Rome's EMT interferes in no way with its ductility. You can make bends—even intricate ones—quickly and easily.

Corrosion resistance A uniformly electrogalvanized exterior finish protects your installation against corrosion. Long dependable service life is assured.

Use easy-fishing, easy-bending Rome EMT on your next job. Contact your nearest Rome Cable representative for more information—or write to Department 905, Rome Cable Corporation, Torrance, California.

ROME CABLE

CORPCRATION



THE STORY OF "LOW-COST" CONSTRUCTION THAT TURNED OUT TO BE THE "HIGH-PERFORMANCE" LINE DESIGN

Almost from the introduction of the Lapp Line Post, adventurous distribution and transmission engineers started experimenting with lines on which conductors were carried on Line Posts horizontally mounted and bolted directly to wood poles.

Nobody could question the *economy* of such construction. About a 25% saving in labor. And, of course, elimination of cost for a lot of crossarms, bracing and hardware. Made an unobtrusive, trim-looking line, too. And certainly a line requiring the narrowest right-of-way you could dream up.

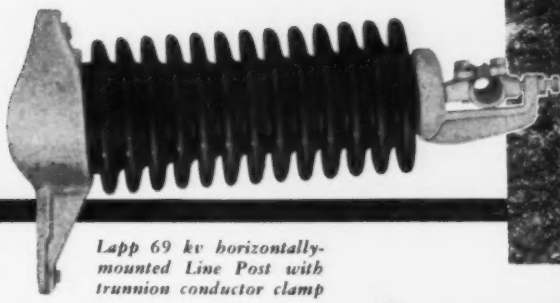
Well, through the years a number of such lines have gone into service, at voltages 13.2 kv to 69 kv, a few of which are shown in snap-shots here. Some of these lines now have been in service for more than 20 years. And, as we've already hinted in the headline to this piece, the service records they've built have been simply remarkable. More than one utility official has told us "the only completely trouble-free line we've ever operated."

There are sound reasons why this should be so, understandable in terms of Lapp Line Post characteristics. In the first place, it's a sturdy one-piece porcelain body, with its hardware attached externally, to impose only large-area low-intensity compression forces on the porcelain. It is the one line insulator mechanically suited to horizontal mounting.

But it's in electrical characteristics that horizontal mounting makes Line Posts shine! Wet flashover values are increased by as much as 15% over upright ratings . . . because more insulator surface is exposed, wetting is more uniform. Natural cleaning is better in wind and rain, too; dry shadow areas are eliminated, reducing incidence of pole fires and contamination flashovers.

We've been encouraged . . . in fact pursued . . . to do something to get this sort of construction standardized. What we've done we're glad to tell you about . . . on the opposite page.

Entire structure is easily assembled on the ground before erection



Lapp 69 kv horizontally-mounted Line Post with trunnion conductor clamp

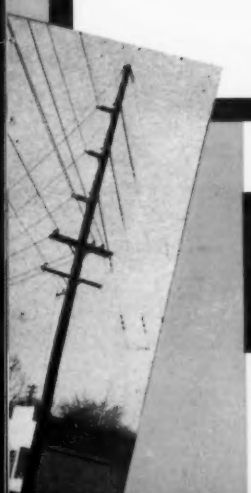
and now...

LAPP LINE POSTS SPECIFICALLY DESIGNED FOR HORIZONTAL MOUNTING

Lapp 69 kv horizontally-mounted Line Post with tie-wire head

A new series of Lapp Line Posts for horizontal mounting is now offered in six voltage ratings: 35 kv, 45 kv, 55 kv, 66 kv, and 88 kv. The bases are malleable iron castings with a mounting radius which will provide maximum contact to Class 1, 2 and 3 poles. Insulators are bolted directly to the pole by bolts at top and bottom of the base. This design provides that full cantilever strength of the insulator be developed with little deflection, and without failure of pole or mounting bolts. (Compare this with typical crossarm construction, where failure of braces or splitting of crossarm would occur at a value far less than the 2800 lbs. for which the insulator is rated.) In addition, longitudinal loading is possible at a value at least 50% more than can be withstood by crossarms. This extra strength permits use of longer span lengths, larger conductors and greater factors of safety.

By use of a simple outrigger shield wire and ground wires, it is practical and economical to achieve a structure flashover value with horizontally-mounted Line Posts greater than that of a typical wood-crossarm wood-brace vertical insulator assembly . . . with no possibility of wood burning or splitting. This is explained in Lapp Data Sheet No. 539, a copy of which is yours for the asking.



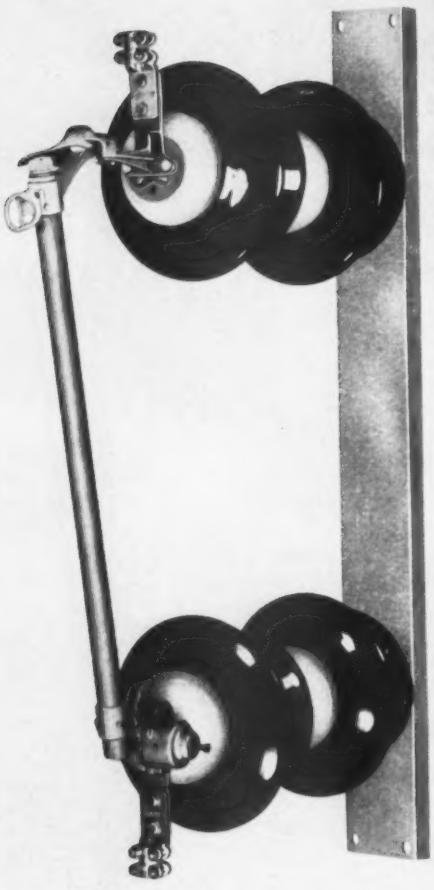
Lapp

LAPP INSULATOR CO., INC., LE ROY, N. Y.

WESTERN REPRESENTATIVES

Los Angeles: Earl S. Condon Co. Seattle: Charles F. James
San Francisco: Donald E. Ingalls Butte: R. E. McDonough Co.
Salt Lake City: Riter Engineering Co.

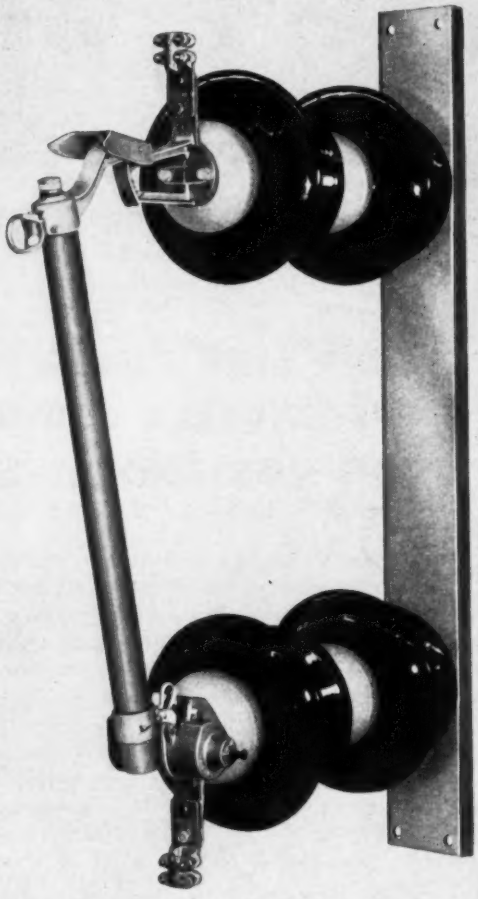
A Powerful New Family of



TYPE BP

7.5 kv to 69 kv—100 and 200 amps

This heavy duty power fuse is ideally suited for economical system protection when interrupting capacities range no higher than 1,491,000 kva.



TYPE MP

46 kv to 161 kv—100 and 200 amps

This extra heavy duty power fuse is the huskiest of the Southern States line, with interrupting ratings as high as 3,480,000 kva. A real brute!

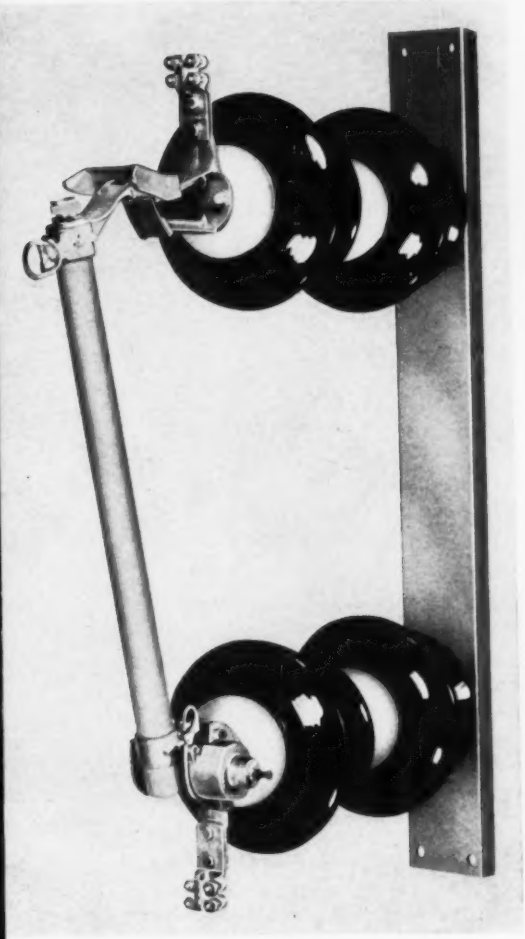
PIONEERS IN POWER FUSES SINCE 1924

SOUTHERN STATES EQUIPMENT CORP.

HAMPTON, GEORGIA

IN CANADA: Dominion Cutout Co., Ltd., Toronto

Power Fuses by Southern States



TYPE HP

7.5 kv to 69 kv—300 and 400 amps

This extra heavy duty fuse is especially suited for applications requiring a combination of high continuous current and interrupting ratings.

COMPLETE FUSE KITS AVAILABLE

These economical kits, in clearly marked packages, provide field personnel with *all the components necessary* for quick, easy re-fusing. They are available in four speed ratios to meet all requirements. Contents are sealed in moisture-free polyethylene bags.

• HIGHEST INTERRUPTING RATINGS

Up to 785,000 kva at 23 kv—
2,350,000 at 69 kv—3,480,000 at 161 kv

• LOWEST INITIAL AND RE-FUSING COSTS

• WIDEST RANGE OF SELECTIONS

Here is the greatest development in power fuses in years! It comes at a time when higher system faults and complex load conditions call for greater reliability in system protective devices.

Southern States Power Fuses can be used with full assurance of positive interruption in the complete range of fault currents—from the lowest that will melt the current-responsive element to the worst jolt the system can deliver!

The fuses employ a new fuse holder design and rugged fibreglass* fuse tubes to clear faults at values never before thought possible.

For example, look at these representative ratings:

TYPE	KV	KVA 3 phase symmetrical
BP	7.5	162,000
BP	15	406,000
BP	23	785,000
BP	34.5	1,175,000
MP	46	1,988,000
MP	69	2,350,000
MP	115	3,110,000
MP	138	2,980,000
MP	161	3,480,000

Find out how these new Southern States Power Fuses can be used on your system—to provide greater protection at lower cost. See your Southern States representative, or

WRITE FOR NEW TECHNICAL BULLETIN 59PF

SOUTHERN STATES EQUIPMENT CORP.
HAMPTON, GEORGIA

**For economy and where duty requirements are not excessively high, fuse tubes of NEMA grade XX bakelite are available below 46 kv at lower prices.*

SPECIFY and BUY

ROCKBESTOS

A.V.C.

INTERLOCKED ARMORED CABLE

For Power Distribution in New Plants or in Modernizing Old Plants For more current capacity than cable in conduit or other armored cable, *specify and buy Rockbestos A.V.C.* . . . for easy installation on racks or hangers beneath the ceiling or next to walls, *specify and buy Rockbestos A.V.C.* . . .

. . . To eliminate costly conduits and ducts . . . to save important dollars on materials and installation time, to permit quick, easy repairs, *specify and buy Rockbestos A.V.C.* . . . All interlocked armored cables are not alike . . . and, for maximum dollar-savings and maximum performance be sure to *specify and buy Rockbestos A.V.C.* Interlocked Armored Cable — the superior AVA Cable.

Write now for the new Rockbestos manual which gives the application and design data to help you *specify and buy Rockbestos A.V.C.*

ROCKBESTOS PRODUCTS CORPORATION, NEW HAVEN 4, CONNECTICUT

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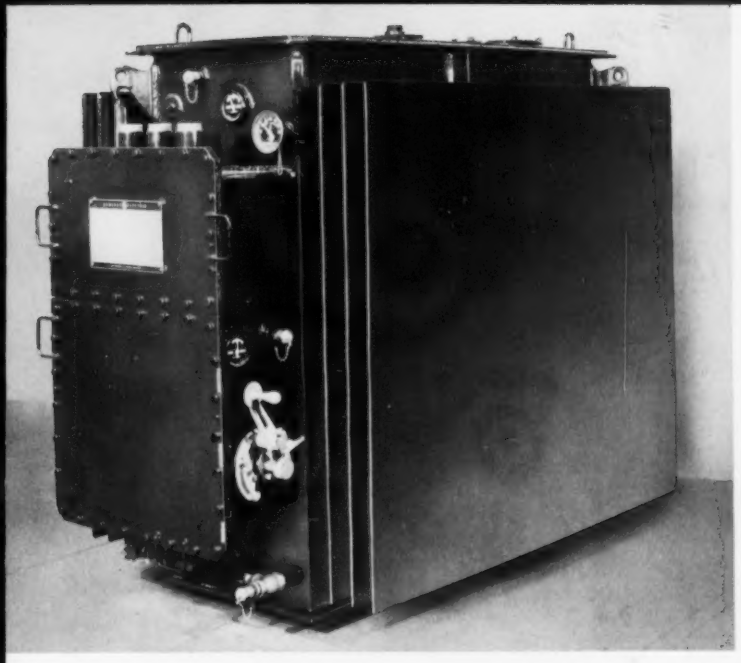
ROCKBESTOS A.V.C.

THE SUPERIOR A.V.A. CABLE

DISTRIBUTION

Equipment News

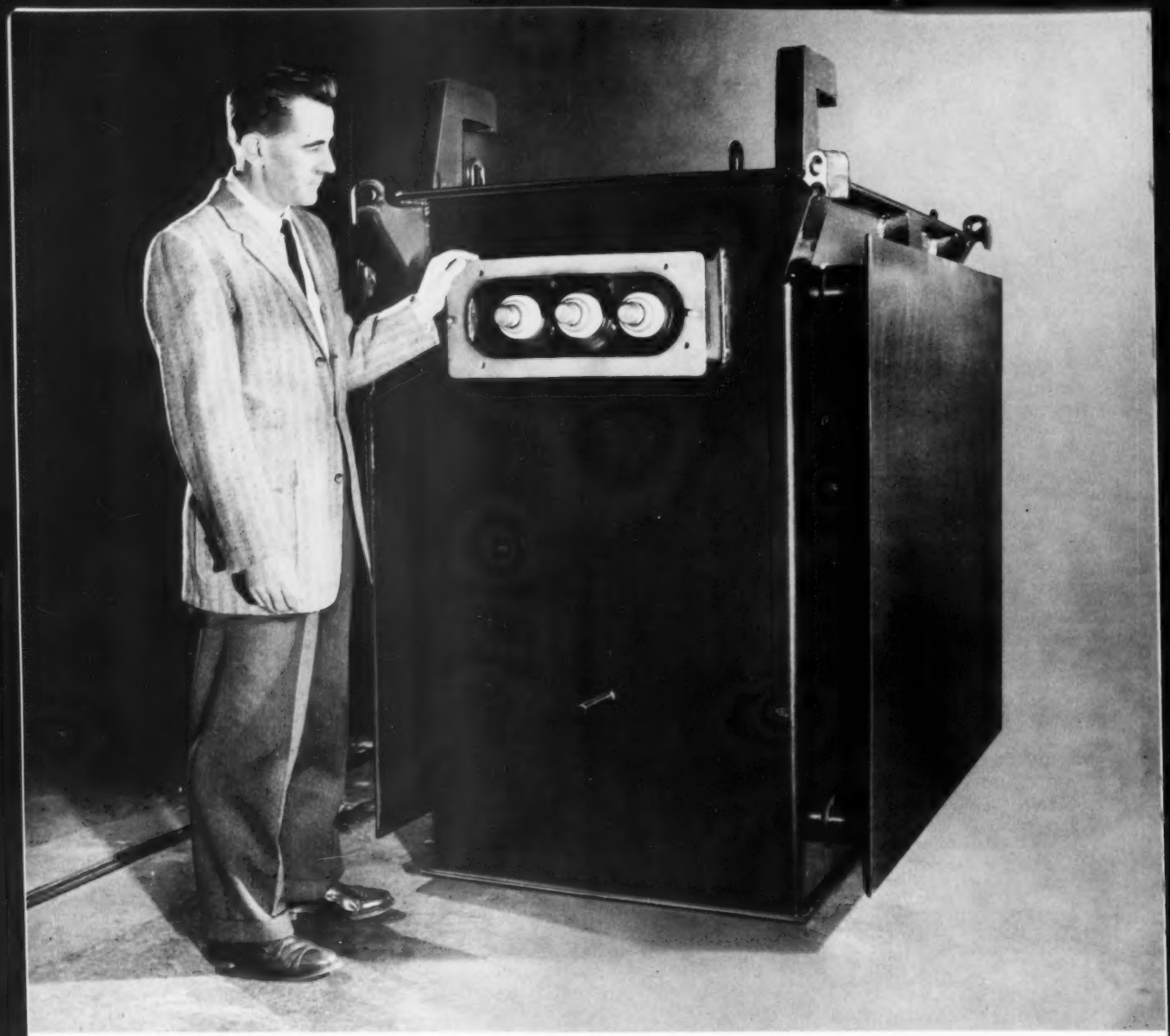


In this issue . . .

- **NEW WELDED LOW-VOLTAGE BUSHINGS** provide hermetic seal on Vaultmaster network transformers

- **NEW SEMI-BURIED TRANSFORMER ENCLOSURES** permit safe, economical use of standard, pole-type units in underground systems

GENERAL ELECTRIC

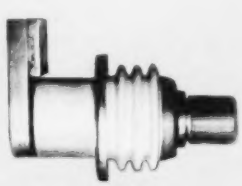


NEW, ALUMINA BUSHINGS welded to the tank inside the L-V throat of a G-E network transformer are shown by design engineer Jerry O'Connell. Transformer is equipped with panel radiators and suspension hooks.

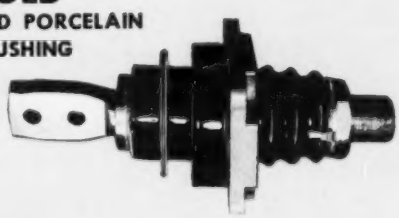
COMPARISON OF NEW ALUMINA AND OLD BUSHINGS

	PORCELAIN	GLASS	ALUMINA
PHYSICAL STRENGTH			
Tensile	3000–8000 psi	4000 psi	26500 psi
Compressive	25000–50000 psi	90000–120000 psi	285000 psi
Flexural	9000–15000 psi	15000–36000 psi	43500 psi
DIELECTRIC STRENGTH	220 VOLTS/MIL	240 VOLTS/MIL	250 VOLTS/MIL
LENGTH			
1½" Stud	13 inches	12 $\frac{13}{16}$ inches	7⅛ inches
2" Stud	14⅜" inches	17 $\frac{3}{16}$ inches	9 $\frac{3}{32}$ inches

NEW
WELDED ALUMINA BUSHING



OLD
CLAMPED PORCELAIN BUSHING



New Welded Bushings on G-E Network Transformers

Hermetically sealed L-V alumina bushings cut maintenance costs, simplify installation

COMPLETELY NEW LOW-VOLTAGE BUSHINGS for network transformers—made of alumina instead of porcelain or glass—are now used on G-E Vaultmaster transformers. The new bushings offer big savings in maintenance costs because of improved sealing. They also simplify installation by reducing over-all height.

REDUCED MAINTENANCE COSTS

New alumina bushings practically eliminate maintenance troubles caused by leaky L-V bushings. The bushings are welded to the tank, instead of clamped, bringing the new G-E units a step closer to the goal of a hermetically sealed network transformer.

SIMPLIFIED INSTALLATION

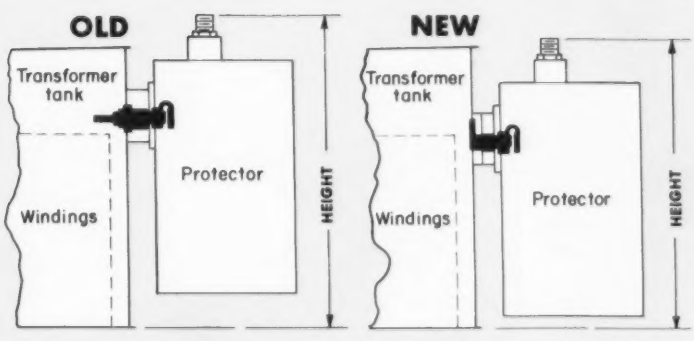
New alumina bushings simplify installation by allowing more room to make cabling connections. Since alumina bushings are shorter than the old types, they are contained entirely within the transformer throat. The throat can thus be lowered, reducing the height of the transformer-protector combination.

SIMPLE CONSTRUCTION

A metal coating is fired on the alumina shell, permitting a special alloy steel cap and a mounting ring to be brazed directly to the alumina. In assembling the bushing, the cap is welded to the conductor stud. The bushing is mounted by welding the mounting ring to an insert in the tank wall. Inert arc welding is used for all sealing.

Progress Is Our Most Important Product

GENERAL ELECTRIC



HEIGHT OF PROTECTOR STUD ABOVE FLOOR			
KVA	OLD	KVA	NEW
500	57 inches	500	54 inches
750	70 inches	750	66 inches
1000	75 inches	1000	70 inches

Welded Bushings Bring Vaultmaster One Step Closer to the Ideal Transformer

HAROLD BRUNTON, JR.

Manager—Network Transformer Sales

For many years, there has been a slow but steady trend toward hermetically sealed network transformers. The trend is understandable in view of the fact that a completely sealed unit is less susceptible to leakage troubles and has less chance of inhaling moisture or other contaminants.

The first big steps were taken around 1940. We welded on the tank cover and switch box and devised a way of eliminating gaskets around the thermometer.

The high-voltage end was the next area to be sealed. Wipe entrances were welded to the terminal chamber. It also became possible to weld on the covers for the high-voltage terminal chamber and switch compartment.

When the welded-on magnetic liquid level gage was perfected, just two openings remained into the network transformer. They were the gasketed low-voltage bushings and the high-voltage switch handle (which is effectively sealed with a packing gland).

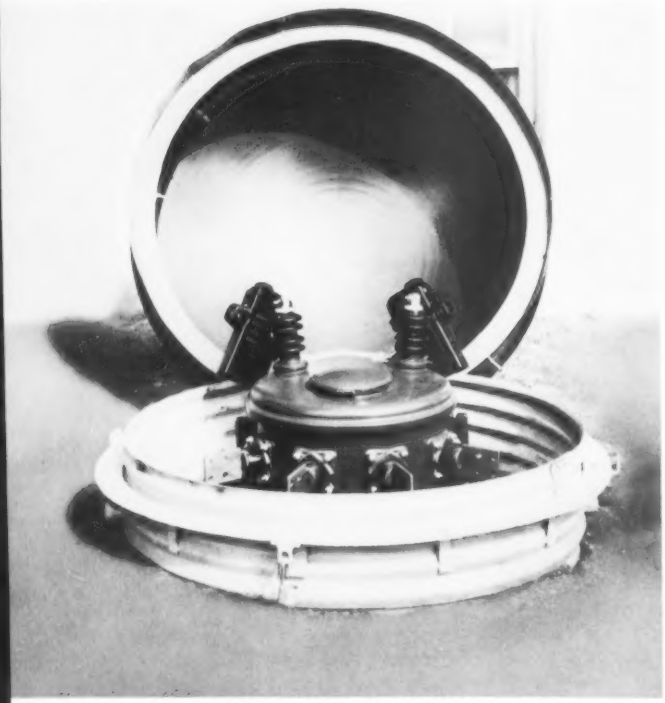
In 1945 we had started supplying solder-seal glass bushings on a limited basis. Since then, glass bushing use had been improved with a change to brazing and just recently, a change to a welded construction. However, we have always wanted a mechanically stronger material than glass. Alumina bushings proved to be the answer.

Alumina is a very hard, shock-resistant ceramic, composed primarily of aluminum oxide (Al_2O_3). It was introduced several years ago on our hermetically sealed pulse and radar transformers. As shown by the comparison table at left, alumina characteristics are superior and our experience with them has been excellent.

Welded alumina bushings are also shorter than previous types. We could use this reduction in one of two ways—shorten the over-all transformer length or reduce the height over the network protector stud. After careful deliberation, we chose the latter because we felt the height was a more critical dimension. Also, we wanted to maintain the working clearance established by EEI-NEMA between transformer tank and protector.

The use of welded alumina bushings brings our standard Vaultmaster units a step closer to the ideal of a hermetically sealed transformer. We anticipate the day when "welded" low-voltage bushings will become standard industry construction.

New G-E Semi-buried Transformer Enclosure Permits Safe, Economical Underground Distribution



NEW G-E ENCLOSURE allows plenty of room for transformer installation and connection. Unit above contains a General Electric 167-kva transformer plus two General Electric cutouts with disconnect blades.

The new G-E semi-buried distribution transformer enclosure provides a safe and economical method of supplying power to modern pole-free residential developments.

The new enclosure easily accommodates pole-type transformers through 167 kva, with plenty of room left for adding disconnects. Thus, linemen experienced in overhead system practices can easily make connections. G-E semi-buried installation can also be easily uprated by merely replacing the transformer.

The 54-inch diameter enclosure is designed for mounting on 48-inch corrugated culvert pipe. The hinged cover projects only 33 inches above ground.

Vent openings are completely baffled for safety of children and for the protection of the transformer against small animals. The all-steel enclosure easily withstands the rigors of field installation.

ADDITIONAL INFORMATION

For additional information on General Electric semi-buried transformer enclosures, contact your nearest General Electric Apparatus Sales Office, or write to General Electric Co., Section 431-84, Schenectady 5, N. Y., for bulletin GEA-6857, "New Semi-buried Transformer Enclosure."

Progress Is Our Most Important Product

GENERAL ELECTRIC

ELECTRA'S HUSBAND——

"A Little Knowledge"

ELECTRA looked up from the article she was reading and over the top of her glasses: "Who said: 'a little learning is a dangerous thing'?"

"It was either Francis Bacon or Alexander Pope—I don't remember which. Why?"

"Well this article from the United Nations gives me goose bumps," Electra replied. "It's about illiteracy."

"So," I sighed, "what about illiteracy—we've always had it and probably always will to a small extent."

"It says here," quoted Electra, "that there are probably 850,000,000 illiterate people in the world. When you stop to think that nearly hall the world's population can't read or write and the other half are toying with atom bombs, it seems to me it's about time to push the panic button."

"The UN is spending a lot of money to improve the situation all over the world. If nothing catastrophic happens, we might have illiteracy licked in two generations."

"That's just like you engineers," complained Electra. "You're always looking at percentages but it says right here that, even though the illiteracy rate is going down, the number of illiterates is increasing. How do you answer that one?"

"It's just that people are breeding faster than schools can be built or teachers found," I replied mildly. "I admit it's not a healthy situation but since you brought the matter up I will confess I'm more concerned with the illiteracy rate in the United States than I am with it in Africa or Sumatra."

"Now you're needling me," said Electra. "It says right here that the illiteracy rate in the United States was only 1.8% for the white population and 10.2% for the nonwhite population in 1952. I can't figure why you should be so greatly concerned over that when you know full well that it's getting better all the time—despite the fact that some of the schools in the South are closed right now."

"Oh, I'll admit that most of the population can read and write but I'm referring to the economic illiteracy of the nation. If you could measure that accurately I'll bet it would be up in the 80% area."

"Ha, you always try to confuse me by bringing into the conversation something that can't be proved. Besides I'm not just sure that I know what you mean by economic illiteracy. Explain."

"All right," I agreed. "It won't be easy but I'll try. Here in this country we've managed to build a great productive machine by relying on the incentive system. This business machine is a very complex mechanism but, up to now any way, has been able to provide the country with good jobs, an ever-increasing number of new products, opportunities for individual advancement and still pay for the cost of running the government. But each year the people demand more and more direct and indirect benefits from it. In fact, there are quite a few people who think the machine would operate a lot better if we removed the incentive section of it entirely.

"Being complex, the machine is somewhat delicate and can be affected by many things. For example, if the people permit government to go in business in competition to the machine that lessens its ability to sell its products and pay taxes. If the people, through their elected representatives, decide that higher and higher wages are to be paid for doing less work, that makes the products of the machine cost more and more until finally people can't afford to buy them. If the people keep on demanding more and more services from the government, then taxes have to go up and the business machine has less and less money to finance its own expansion."

"I think I see your point," interrupted Electra, "but I also could see where your philosophy, carried to an extreme, could make the entire country completely dependent upon pampering business."

"I was hoping you would say that, Electra. You might compare the business machine to the goose that laid the golden eggs. You want to keep it fat, healthy and productive. Right now there seems to be a lot of people who think it can be badgered and harassed into a greater egg production. And a lot of the things that it is being asked to do result from just plain illiteracy as to the economic facts of life."

"Well I don't think you're going to have much luck making economists out of the rank and file of the general public," said Electra practically. "As a matter of fact, your friends who pride themselves on their economic theories rarely agree on what's right and what's wrong, so how do you expect to find a way to reach this proposed Utopia?"

"Now don't be sarcastic," I chided. "It's not quite as complicated as it might appear because if we could build a good climate in which business could operate satisfactorily in every community then the over-all result could not help but be good. And there are more and more businessmen who are about ready to admit that they've got to get out and show people how to get a good business climate locally."

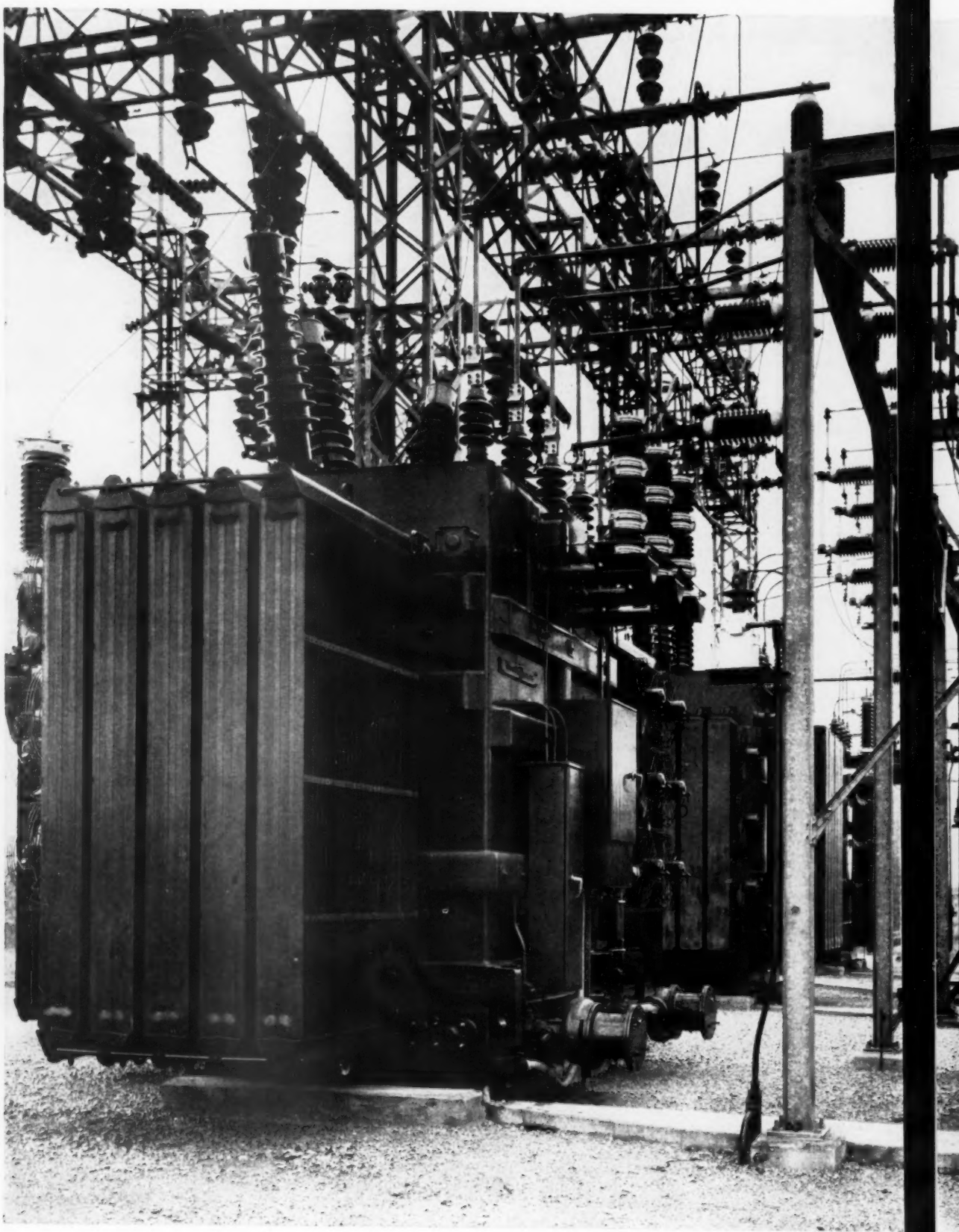
"That sounds to me like you're trying to replace the city council with the Rotary Club or the Chamber of Commerce," said Electra suspiciously.

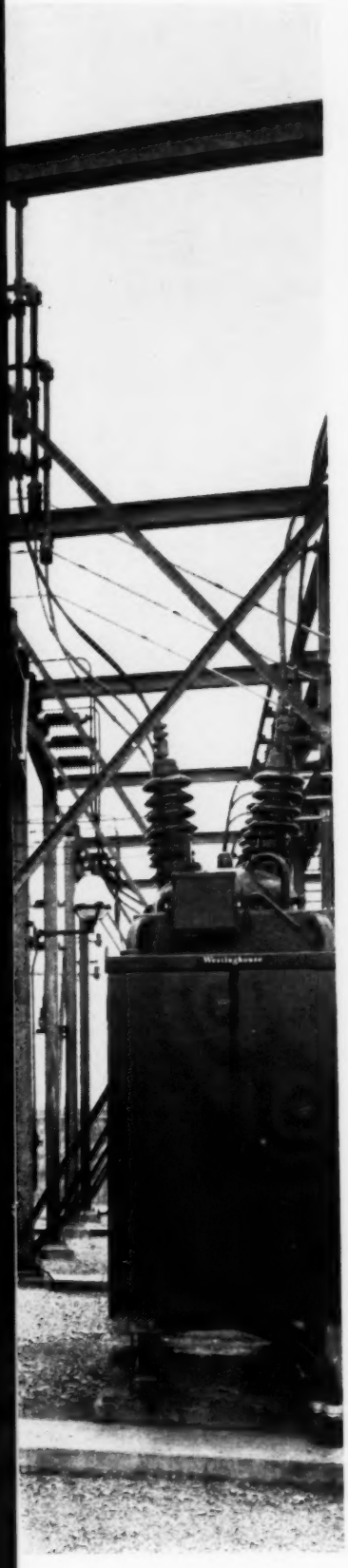
"That's not it at all," I protested. "Most people are proud of their communities and they want them to grow, and prosper, and be a better place to live. The trouble is that they all too often either vote for or condone conditions that make it difficult for the businessman who is largely responsible for keeping the community on its feet financially. In fact, some communities have been so indifferent that businesses have actually moved away to more appreciative areas."

"I still don't see how you're going to do the education job that this involves," said Electra.

"Well, I admit that it's going to take the concerted efforts of most of the managerial and supervisory employees in each and every business. All of them are going to have to get out and try to lift the level of economic and political understanding among their fellow employees and neighbors. They're going to have to stand up and speak out on political issues and they're going to have to take an active part in party politics—regardless of which party they belong to. Basically they're going to have to try and hammer home the thought that there's no such thing as a free lunch."

"You're probably right," sighed Electra, "and you may be a great economist too. But I know human nature. You've cut yourselves a man-sized job."





Bonus Value Beyond the Specification...

HIGHEST KVA PER POUND

New Westinghouse Inner-Cooled Transformer Construction Also Cuts Installation Space and Cost

New York State Electric & Gas Corporation recently installed the world's first transformer with Inner-Cooled construction. Developed by Westinghouse, Inner Cooling makes possible drastic size and weight reductions; in this instance, weight per kva of the 30,000/40,000/50,000-kva transformer has been reduced from 3.5 to 3.1 pounds per kva; and on the higher voltage, higher kva units, the weight per kva has been reduced to as low as 1 pound per kva.

In addition to the installation savings made possible by major space and weight reductions, Inner Cooling also promises operating savings through lower impedances and improved performance. And by crashing the size barrier, Inner-Cooled construction makes it possible now to build and ship transformers with ratings up to 600,000 kva or more . . . to meet all demands of the foreseeable future.

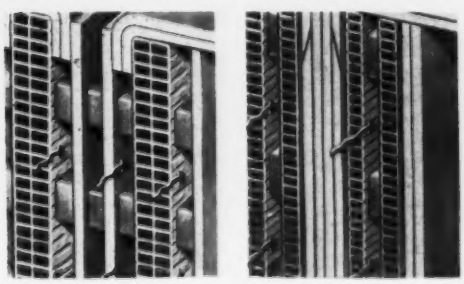
Ask your Westinghouse representative for the full story on the new Inner-Cooled construction—another "Bonus Beyond the Specification" made possible through Plowback of Earnings into transformer research and development.

J-70829

YOU CAN BE SURE...IF IT'S Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV MONDAYS

WORLD'S FIRST Inner-Cooled transformer (at left) is installed on the system of New York State Electric & Gas. Located at Hinman Road Substation, Lockport, New York, this Westinghouse power transformer is rated at 30,000/40,000/50,000-kva, OA/FOA/FOA. The Inner-Cooled transformer is installed in the same space as that of previously installed 15,000/20,000/25,000-kva transformer in the background.



Ordinary transformer construction (left) places the oil ducts on both sides of the coil consisting of multiple conductors wound in parallel. Inner Cooling (right) positions the oil ducts between the parallel-wound conductors, with cellulose material between adjacent coils. This utilizes fully both the dielectric and mechanical strengths of conventional transformer materials.

OTHER WESTINGHOUSE POWER TRANSFORMER BONUS VALUES

Insuldur* Insulation System—"Form-Fit" Construction—Vapor/gas Cooling—Reduced Sound Levels

*Trade-Mark

when Campbell's new street lights went up . . . SO DID BUSINESS!

It's wonderful the change that comes over a town when its streets are made bright, safe and friendly. Merchants notice its first effects in *nighttime shopping*...people feel more comfortable about stepping out after dark. Civic pride is bolstered . . . even real estate values have a way of rising in the light of "good municipal housekeeping."

Campbell's new street lights introduce two important advances: Individualized automatic operation (photoelectric cells turn *each light* on as required at dusk; off at dawn), and a new color corrected mercury vapor light that provides much more natural illumination.

Want to bring safe, friendly streets to your town? Ask the local P. G. and E. office for the free booklet, "Modern Street Lighting for YOUR Community."

P·G and E·

Pacific Gas and Electric Company

ELECTRICAL WEST

VOL. 122, NO. 3
MARCH 1959

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

Utility executives report more customers, increased kwh consumption in . . .

The West's 1958 Sales Record

DESPITE the recession, the West's electric utilities ended 1958 with some 287,500 more customers than they were serving in 1957 and with a 12-month sales record that stacks up favorably with accomplishment in the rest of the country.

Data on the following tables were given in ELECTRICAL WEST's annual survey of sales accomplishment. Seventy-nine of the 100 utility executives queried reported customer and consumption figures. With 8,732,836 customers as of Dec. 31, this answering group serves 97% of the West's electric meters.

Only 10 of the respondents reported a drop in total customers served as compared with 1957. Seven of these showed growth in some classification—three in residential, three in commercial-industrial and one in irrigation.

Average residential consumption ranged from a high of more than 13,000 to a low of 239 kwh. However, 60% of the answering executives reported average home use above 3,000 kwh and 34% above 5,000 kwh.

While only eight reported a drop in average residential consumption from 1957, several noted that the gain should have been greater. Mild weather in the Northwest was reflected in consumption figures from that area. Accounting changes and meters set in large tracts not yet occupied also affected the picture.

The earlier 1958 survey made by *Electrical Merchandising* showed the

MEDALLION HOMES added load in 1958. Top: Provo's first Medallion; center: all-electric Parade Kitchen in Honolulu; right, air-conditioned Medallion Home in San Diego; below, southern California utilities kick off joint drive for electric load

Residential Consumption

Power Companies

Utility Territory	Average Annual Kwh Residential 1958	1957	1956	1955
Southern Nevada Power	9,860	9,373	9,777	10,094
California Oregon Power	8,633.43	8,666.55	8,420.90	8,005.53
Portland GE	8,493	8,422	8,103	7,645
Washington Water Power	8,214	8,095	7,845	7,487
Puget Sound P&L	7,840	7,642	7,205	6,540
Pacific P&L	7,047	6,931	6,563	6,108
Idaho Power	6,935	6,764	6,463	6,185
Calif.-Pacific Utilities	6,089	5,895	5,729	5,464
Sierra Pacific Power	5,000	4,930	4,675	4,548
B. C. Electric, Vancouver	4,570	4,461	4,202	3,861
Hawaiian Electric	4,393	4,225	3,983	3,788
Utah P&L*	4,128	4,047	3,891	3,785
Alaska EL&P	4,087	3,850	3,682	
B. C. Electric, Victoria	4,063	3,908	3,605	3,317
Raton PS	3,880	3,560	3,309	3,145
Montana Power	3,736	3,684	3,471	3,241
Arizona PS	3,567	3,180	2,962	2,682
El Paso Electric	3,553	3,147	2,936	2,643
Maui Electric	3,156	3,084	3,012	2,892
Lahaina L&P	3,071.9	3,204.2	3,213.3	3,155
PG and E	3,046	2,923	2,747	2,616
Tucson GEL&P	2,966	2,712	2,521	2,255
N. M. Electric Service	2,940	2,715	2,495	2,150
Elko Lamoille Power	2,831	2,685	2,486	2,366
Colorado Central Power	2,823	2,677	2,490	2,345
San Diego G&E	2,805	2,752	2,639	2,575
Hilo Electric	2,783	2,688	2,534	2,539
Southwestern PS, Pecos Valley	2,776	2,483	2,248	2,023
California Electric Power	2,690	2,433	2,349	2,220
PS of Colorado	2,657	2,541	2,362	2,236
Cheyenne LF&P	2,641.95	2,635.6	2,503.2	2,356.62
Southern Colo. Power	2,460	2,329	2,217	2,068
Southern Calif. Edison	2,360	2,288	2,165	2,033
Calgary Power	2,268	2,119	2,104	1,908
Rawlins Electric	285	270	250	235
Mont.-Dak. Utilities, Sheridan	245	242	214	209

* Includes Western Colorado Power

Municipal Utilities

Utility Territory	Average Annual Kwh Residential 1958	1957	1956	1955
Eugene W&E Board	10,269	9,908	9,000	8,225
Tacoma City Light	8,955	9,040	8,977	8,504
Seattle City Light	8,063	7,961	7,786	7,488
Centralia Light Dept.	8,025	7,974	7,549	6,985
Northern Lights	5,620	5,489	4,681	4,363
Anchorage L&P Dept.	3,588	3,259	2,894	2,554
Mesa City Utilities	3,548	3,158	2,944	2,665
Provo Dept. of PU	3,226	2,553		
Palo Alto Electric Dept.	2,804	2,538	2,506	2,258
Riverside PU Dept.	2,794	2,760	2,880	2,896
Fort Collins L&P Dept.	2,705	2,570	2,245	1,963
Fairbanks Electric Utilities	2,666	2,440	2,310	
Burbank PS Dept.	2,530	2,430	2,330	2,240
Glendale PS Dept.	2,400	2,232	2,136	2,004
Pasadena MU	2,395	2,353	2,224	2,078
Alameda PU Dept.	2,379	2,295	2,238	2,136
Los Angeles Dept. of W&P	2,270	2,158	2,106	1,978.8
Ketchikan PU	445.8	421.8		

Districts, REAs, Commissions

Utility Territory	Average Annual Kwh Residential 1958	1957	1956	1955
Grant County PUD No. 2	13,484	13,856	13,270	12,669
Cowlitz County PUD No. 1	12,136	12,207	11,885	10,840
Benton County PUD No. 1	11,428	11,872	11,183	10,243
Clark County PUD No. 1	9,631	9,424	8,887	8,149
Franklin County PUD No. 1	9,591	9,806	9,373	8,567
Snohomish County PUD No. 1	8,559	8,329	7,746	6,833
Grays Harbor County PUD No. 1	8,450	8,320	7,740	7,080
Turlock Irrigation District	8,400	7,941	7,605	7,150
Pacific County PUD No. 2	8,289	8,101	8,663	8,620
Okanogan County PUD No. 1	8,226	8,271	7,832	7,040
Mason County PUD No. 3	7,932	7,354	7,132	6,651
Lewis County PUD No. 1	7,918	7,784	7,664	6,898
Chelan County PUD No. 1	7,657	7,600	7,172	6,576
Salt River Power District	4,750	4,278	4,023	3,879
Roosevelt County Elec. Co-op.	4,369	4,048	3,801	3,404
Chugach Electric Assn.	4,321	3,934	3,361	3,193
Modesto Irrigation District	3,919	3,855	3,525	3,333
Matanuska Elec. Assn.	3,755	3,494	3,304	2,921
B. C. Power Commission	3,652	3,573	3,279	2,796
Sacramento MUD	3,597	3,338	3,065	2,817
Marias River Elec. Co-op.	2,945	2,830	2,750	2,700
Y-W Electric Assn.	2,792	2,479	2,409	2,254
Jemez Mountains Elec. Co-op.	2,488	2,475	2,282	2,008
Intermountain Rural Elec. Assn.	239	208	194	192

Pacific area leading all other regions of the United States in per thousand sales of washer-dryer combinations and food waste disposers and tying for first place on dishwashers and TV. The Mountain area led the regions in washers and clothes dryers and tied on TV. These areas were ahead of the national showings in every category except air conditioners and, in the Mountain area, vacuum cleaners. The West's detailed appliance sales record is on p. 64-65.

Electric heat proved a load builder in 1958 and shows up repeatedly in promotions announced for 1959. Following is a list of utilities reporting 1958 heating load additions of 1,000 kw or above:

Heating Load Added in Kw	
Salt River Power District	2,619*
PG and E	52,000*
Sacramento MUD	2,994
Southern California Edison	8,143
Southern Nevada Power	7,000
California Oregon Power	15,000
Eugene W&E Board	14,364
Portland GE	24,000
Southwestern PS, Pecos Valley Division	1,034
Utah P&L	1,169
Benton County PUD	2,722
Chelan County PUD	2,004
Clark County PUD	12,100
Cowlitz County PUD	8,520
Franklin County PUD	1,500
Grays Harbor County PUD	2,500
Puget Sound P&L	30,000
Seattle City Light	27,000
Snohomish County PUD	12,654
Tacoma City Light	4,500
Washington Water Power	28,086
B. C. Electric, Vancouver	4,440
B. C. Power Commission	1,200

*Residential only.

Here are comments about individual utilities:

Anchorage expects to promote the Medallion Home during 1959.

California Electric Power states that it would be safe to add about 10% to its appliance sales records because of units moved on company lines from the Los Angeles market.

California-Pacific Utilities will continue its Housepower and Medallion programs and will work to secure full industry cooperation. This company's electric revenues showed an increase of 15.6% in 1958, due partly to addition of Southern Utah Power properties in midyear. However, even without these additional revenues, the increase was 4.1%. Including the new Southern Utah Division, average annual residential use increased 3.3% during 1958. A 10-year summary of residential consumption shows an increase of 142%. Cooperating dealers on California-Pacific lines increased their sales of major appliances by 12.7%.

Housepower and LBE programs, including Medallion Homes in selected areas, will be promoted by **PG and E,** which will give full support to the 100-amp service entrance standards. Promotions will be coordinated through the Northern California Electrical Bureau.

Pasadena has changed its accounting system to give definite information on kwh consumption.

Emphasis in **Sacramento MUD** area will be on Medallion Homes with electric water heaters and electric heat. Major effort in commercial lighting will be shifted to the new construction market.

Sales efforts of **Southern California Edison** will continue on the Medallion Home with special emphasis on heat pumps and other types of electric heating.

Maui Electric reports decreased sales in some areas as a result of the four-month sugar strike.

Although **Northern Lights** residential customers include 543 seasonals, kwh consumption is exclusive of these customers.

A community TV system installed in 1958 accounts for TV sales on **Raton's** system.

Pacific Power & Light will put more emphasis on residential and commercial lighting and air conditioning.

Chelan County PUD started a 200-amp rewiring program on Jan. 1 and is making a $100 reimbursement on qualifying installations.

Cowlitz County PUD will put its major promotional effort on outdoor living, including street lighting.

Franklin County PUD reports that its drop of 215 kwh in home consumption was due to extremely mild winter weather. Its peaks and energy sales are sensitive to winter temperatures, it reports, since residential electric heat saturation is close to 25% and it also has many commercial electric heat installations.

Puget Sound Power & Light will aim its sales efforts at Medallion Homes and will accelerate water heating promotion. It will continue special effort on summertime use.

B. C. Electric will put greater stress on commercial air conditioning, freezers, dryers and home lighting.

Southern Nevada Power will continue to push the heat pump.

Provo, which started promoting the bronze Medallion in July 1958, in 1959 will turn to the gold Medallion.

Utility Customers

Utility Territory	Total Customers 1958	Total Customers 1957	Residential-Urban & Rural 1958	Residential-Urban & Rural 1957
PG and E	1,848,336	1,801,479	1,513,635	1,469,460
Southern Calif. Edison	1,501,812	1,456,526	1,287,895	1,244,393
Los Angeles Dept. of W&P	884,384	857,981[2]	742,581	719,302
PS of Colorado	303,655	294,864	263,167	255,204
San Diego G&E	293,923	276,227	251,926	235,799
Pacific P&L	280,741	275,631	241,054	237,784
B. C. Electric, Vancouver	276,395	263,394	236,288	224,910
Portland GE	245,502	241,178	216,560	212,706
Seattle City Light	229,867	226,414	206,319	203,320
Utah P&L[3]	223,855[1]	208,968	197,852[1]	185,774
Puget Sound P&L	207,432	200,059	187,269	180,640
Arizona PS	161,514	153,659	133,941	127,939
Montana Power	145,966	143,035	125,113	122,532
Washington Water Power	145,001	143,647	128,700	127,522
Sacramento MUD	142,572	135,601	123,434	116,921
Idaho Power	129,858	127,296	108,865	106,815
Hawaiian Electric	106,455	102,909	90,185	86,928
Calif. Electric Power	98,661	93,119	82,539	77,600
Calgary Power	98,407	90,043	47,656	43,575
Calif. Oregon Power	88,879	86,952	72,157	70,664
El Paso Electric	85,915	82,409	75,868	71,850
B. C. Power Commission	79,028	74,112	66,644	62,385
Tucson GEL&P	68,824	65,718	59,160	56,388
Salt River Power District	68,609	59,455	62,943	54,433
Tacoma City Light	62,831	61,132	55,245	53,830
Snohomish County PUD No. 1	56,815	54,589	51,839	49,763
B. C. Electric, Victoria	52,463	50,526	45,137	43,437
Glendale PS Dept.	51,388	50,232	43,153	42,056
Pasadena L&P Dept.	49,120	48,414	42,308	41,713
Southern Colorado Power	47,441	46,575	41,810	40,938
Sierra Pacific Power	40,196	37,631	33,349	31,222
Colorado Springs PU	38,759	36,381	37,006	35,223
Burbank PS	36,931	36,372	30,864	30,482
Calif.-Pacific Utilities	35,064	29,602	28,741	24,369
Southern Nevada Power	32,610	31,585	26,180	24,817
Clark County PUD No. 1	32,088	31,550	28,675	28,206
Colorado Central Power	31,342	29,148	27,936	25,862
Southwestern PS, Pecos Valley Div.	30,368	30,256	25,669	25,507
Riverside PU Dept.	28,226	27,010	24,687	23,612
Modesto Irrig. Dist.	27,002	26,309	22,674	22,048
Eugene W&E Board	26,881	26,090	23,687	22,844
Grays Harbor County PUD No. 1	21,756	21,524	17,782	17,594
Cowlitz County PUD No. 1	21,267	21,418	18,836	19,023
Turlock Irrigation District	20,089	19,454	16,982	16,749
Hilo Electric	18,446	18,415	14,566	14,580
Palo Alto Electric Dept.	17,909	17,426[1]	15,160	14,841
Cheyenne LF&P	15,963	15,455	14,064	13,572
Chelan County PUD No. 1	15,864	15,530	13,860	13,539
Alameda Bureau of Electricity	15,755	15,481	13,967	13,728
Grant County PUD No. 2	13,883	14,271	10,665	11,050
Lewis County PUD No. 1	11,771	11,878	10,378	10,487
New Mexico Electric Service	11,520	10,959	9,281	8,867
Chugach Electric Assn.	10,705	10,570	10,074	9,971
Maui Electric	10,471	10,453	8,542	8,539
Benton County PUD No. 1	10,031	9,333	8,696	8,103
Provo Dept. of PU	9,660	9,461	8,553	8,305
Okanogan County PUD No. 1	9,017	8,741	6,958	6,721
Fort Collins L&P Dept.	8,066	7,643	6,523	6,218
Anchorage L&P Dept.	7,766	7,659	5,912	5,866
Pacific County PUD No. 2	7,404	7,380	6,025	5,984
Intermountain REA	7,401	6,846	3,513	3,303
Franklin County PUD No. 1	7,032	6,763	5,693	5,450
Jemez Mountains Elec. Co-op.	6,412	6,125	3,708	3,607
Mason County PUD No. 3	6,282	5,890	5,715	5,308
Mont.-Dakota Utilities	6,129	6,142	5,303	5,292
City of Mesa	5,648	5,465	4,627	4,458
Centralia Light Dept.	5,028	5,346	4,156	4,292
Fairbanks Electric Utilities	4,812	5,191	4,077	4,441
Northern Lights	3,596	3,491	3,133	3,028
Y-W Electric Assn.	3,453	3,390	2,837	2,765
Alaska EL&P	3,216	3,157	2,629	2,600
Ketchikan PU	3,107	3,142	2,591	2,602
Rawlins Electric	3,054	2,981	2,466	2,425
Raton PS	3,018	3,030	2,343	2,360
Roosevelt County Elec. Co-op.	2,826	2,778	1,809	1,787
Marias River Electric Co-op.	2,795	2,770	1,593	1,568
Elko Lamoille Power	2,588	2,537	2,117	2,073
Matanuska Elec. Assn.	1,759	1,611	1,260	1,125
Lahaina L&P	1,474	1,483	1,294	1,285

[1] Includes agricultural power. [2] As of June 30. [3] Includes Telluride Power Co. for 1958.

The West's Appliance

	Residential Customers	Refrigerators	Home Freezers	Ranges	Water Heaters	Washers Automatic	Washers Conventional	Dryers	Combination Washer-Dryer
ALASKA									
Chugach Electric Assn.	10,074	244	295	268	350	312	60	340	160
Ketchikan PU	2,591	75	15	45	60	125	15	62	15
Matanuska Elec. Assn.	1,260	22	20	22	5	10		6	
ARIZONA									
Arizona PS	133,941	15,500	3,700	10,000	1,400	15,500	3,400	1,600	1,900
Mesa City Utilities	4,627	250	40	60	170	120	80	50	20
Salt River Power District	62,943	4,500	1,500	3,000	400	4,700	1,600	700	200
Tucson GEL&P	59,160	2,500	400	800	200	2,000	1,000	350	100
CALIFORNIA									
Alameda PU Dept.	13,967	250	100	370	5	250	50	225	25
Burbank PS Dept.	30,864	279	18	115	12	260	75	160	25
California Electric Power	82,539	1,975	300	825	390	3,700	350	500	150
Calif.-Pacific Utilities	28,741	972	527	1,032	827	1,100	600	934	65
Los Angeles Dept. of W&P	742,581③	46,300	4,600	5,126	1,500	70,043	3,502	7,030	
P G and E	1,513,635	88,000	26,000	53,500	12,000	104,000②		42,000	12,000
Pasadena MU	42,308			627	38				
Riverside Dept. of PU	24,687			751	34				
Sacramento MUD	123,434	12,059	3,001	8,847	2,380	13,118	1,553	8,265	2,179
San Diego G&E	251,926	21,085	5,100	6,525	2,300	21,060	1,985	2,545	1,010
Southern Calif. Edison	1,287,895	102,700		24,400				15,200⑨	
COLORADO									
Colorado Central Power	27,936	350	150	643	22	400	200	300	
Fort Collins L&P Dept.	6,523	888	277	318		363		231	76
Intermountain REA	3,513	60	23	93	55	30		56	
PS of Colorado	263,167	22,300	4,400	8,000	1,600	23,300	3,100	8,500	1,600
Southern Colorado Power	41,810	2,103	1,083	851	143	2,582	1,001	754	305
Y-W Electric Assn.	2,837	82	67	31	28	59	10	47	7
HAWAII									
Hawaiian Electric	90,185	8,500	2,200	4,493	5,317	9,500	1,800	619	250
Hilo Electric	14,566	500	150	320	355	350	200	73	10
Maui Electric	8,542	383	57	219	262	321	57	17	
IDAHO									
Idaho Power	108,865	7,500	5,031	8,572	6,786	11,000	1,000	6,002	600
Northern Lights	3,133	55	94	109	131	51	1	55	
MONTANA									
Montana Power	125,113	5,430	2,081	3,091	1,600	7,430		5,240	1,004
NEVADA									
Sierra Pacific Power	33,347	1,186	167	930	638				
Southern Nevada Power	26,180	1,218	273	770	548	1,327	194	184	72
NEW MEXICO									
N. M. Electric Service	9,281	661	572	116	0	648	85	152	79
Raton PS	2,343				63				
Roosevelt County Elec. Co-op.	1,809	15	20	14	11	22	10	8	
OREGON									
California Oregon Power	72,157	2,755	843	2,800	3,800	3,846		4,356	394
Pacific F&L	241,054	21,817	12,160	18,168	11,073	30,679	4,435	23,069	
Portland GE	216,560	17,500	8,000	13,800	10,000	17,000	2,000	14,000	1,000
TEXAS									
El Paso Electric	75,868	8,780	2,491	2,944	3,495			1,260	
Southwestern PS, Pecos Valley Div.	25,669	1,495	880	729	186	1,939	325	629	
UTAH									
Utah P&L	197,852④	12,205	5,498	12,090	4,953	16,196	4,471	6,940	1,324
Provo Dept. of PU	8,553	500	203	461	70	807	122	407	
WASHINGTON									
Chelan County PUD No. 1	13,860	729	451	532	403	702	149	327	92
Clark County PUD No. 1	28,675	1,500	450	1,500	1,750	1,000	150	1,100	75
Cowlitz County PUD No. 1	18,836	922	642	805	2,393	1,576	262	1,345	389
Grays Harbor County PUD No. 1	17,782			600	600			365	
Okanogan County PUD No. 1	6,958	100	100	50	50	50	50	25	25
Pacific County PUD No. 2	6,025	200	100	200	250	450	50	350	20
Seattle City Light	206,319	20,000	4,500	15,000	15,000	19,000	2,000	14,000	
Snohomish County PUD No. 1	51,839	3,000	1,000	3,000	3,000	3,000	1,000	1,800	200
Tacoma City Light	55,245	6,550	2,000	7,000	4,100	5,500	1,000	6,000	1,200
Washington Water Power	128,700	14,350	7,790	7,230	6,605	15,205	4,400	10,275	1,715
WYOMING									
Cheyenne LF&P	14,064	763	281	432	79	1,205	347	748	111
Mont.-Dak. Utilities	5,503	257	115	213	13	301	108	113	14
Rawlins Electric	2,466	36	6	37	4	73	2	47	25
BRITISH COLUMBIA									
B. C. Elec., Vancouver	236,288	12,566	2,828	8,959	9,958	6,531	1,235	5,183	464
B. C. Elec., Victoria	45,137	3,007	837	1,970	485	1,383	1,421	703	
B. C. Power Commission	66,644	1,400	1,400	2,000	3,000	1,400	1,400	600	100

* Service records. † For December only. ① Commercial. ② Total quantity. ③ As of June 30. ④ Residential only. ⑤ Also meter cards and contracts. ⑥ Includes Western Colo. Power and Telluride Power customers (includes agricultural). ⑦ Includes central units also. ⑧ Distributor reports. ⑨ Includes combination washer-dryers.

Sales Record for 1958

Ironers	Dishwashers	Food Waste Units	Room Conditioners	Heat Pump	Radios	Television	Appliance Sales Estimated	Appliance Sales Dealer Reports	
									ALASKA
35	56	40	0	8	160	280	X		Chugach Electric Assn.
2	16	16	0	0	205	70	X		Ketchikan PU
2	10	4			75	25		X	Matanuska Electric Assn.
									ARIZONA
150	2,800	1,900	4,500	450	20,600	28,000		X	Arizona PS
40	60	60	200	25	200	200	X		Mesa City Utilities
	800	900	2,891(7)	300		40,000			Salt River Power District
100	300	100	300	10	3,000	4,000	X		Tucson GEL&P
									CALIFORNIA
50	100	100	12(1)	1	400	400			Alameda PU Dept.
15	40	180	315	2	290	625	X		Burbank PS Dept.
	400		3,600	375				X	California Electric Power
125		350	260	10		2,700	X		Calif.-Pacific Utilities
			13,700			89,000	X		Los Angeles Dept. of W&P
	25,500	27,800	10,800	750	128,000	152,000	X†	X	PG and E
							X		Pasadena MU
							X		Riverside Dept. of PU
	3,401	5,166	4,876	29(4)		17,880		X	Sacramento MUD
	3,000	8,500	2,900		74,500	39,728		X(5)	San Diego G&E
	15,800		26,000	639		161,100	X		Southern Calif. Edison
									COLORADO
				1			X		Colorado Central Power
	294	422	180	0			X		Fort Collins L&P Dept.
11	20	20	8	16	40	28	X		Intermountain REA
800	5,000	4,600	2,000			4,900	X		PS of Colorado
52	171	729	159	0	1,793	2,593	X	X	Southern Colorado Power
12	4	9	31	0	100	400	X		Y-W Electric Assn.
									HAWAII
	512	1,000	319			10,000	X	X	Hawaiian Electric
	34	100	10		700	500	X	X	Hilo Electric
3	36	31	57	0	414	457		X	Maui Electric
									IDAHO
2,000	900	1,000	750	10	8,000	15,000	X	X	Idaho Power
	6			0		53		X(5)	Northern Lights
									MONTANA
	1,072	1,000	239			18,651	X		Montana Power
									NEVADA
								X	Sierra Pacific Power
163	153	120	658(7)	959(7)	948	1,877		X	Southern Nevada Power
									NEW MEXICO
6	61		126	0		1,297		X	N. M. Electric Service
						600	X		Raton PS
0	0	0	15	0	30	27	X	X	Roosevelt County Elec. Co-op.
									OREGON
	811		929			5,650	X		California Oregon Power
777	4,048	1,644	2,345		35,019	36,785		X	Pacific P&L
	3,500		600	15		17,500	X		Portland GE
									TEXAS
	938		890	46		14,195		X(5)	El Paso Electric
39	213		2,221	105		3,625		X	Southwestern PS, Pecos Valley Div.
									UTAH
	93	127	59	0	857	799		X	Provo Dept. of PU
1,833	3,156	5,344	4,928(7)	5	20,915	19,144		X	Utah P&L
									WASHINGTON
16	189	87	210		810	664	X		Chelan County PUD No. 1
100	300	200	60	10	1,500	1,500	X		Clark County PUD No. 1
	265	150	59	1		1,875	X	X	Cowlitz County PUD No. 1
							X		Grays Harber County PUD No. 1
10	15	10	100	1	100	100	X		Okanogan County PUD No. 1
30	50	10			400	350	X		Pacific County PUD No. 2
						25,000	X		Seattle City Light
250	1,200	400	15	10	2,000	3,000	X		Snohomish County PUD No. 1
	1,350	1,400		50		11,000	X		Tacoma City Light
335	2,310	940	1,728		23,500	31,600		X	Washington Water Power
									WYOMING
21	57	57	23	0	1,417	1,965	X	X	Cheyenne LF&P
43	36	27	21	0	413	767		X	Mont.-Dak. Utilities, Sheridan
6	6	8	0	0	0	40		X	Rawlins Electric
									BRITISH COLUMBIA
128	776	415	186		14,218	17,956	X		B. C. Elec., Vancouver
11	67	282			2,848	4,468		X	B. C. Electric, Victoria
50	400	300			5,000	3,000	X		B. C. Power Commission

The Dave Johnston story—coal and courage bring a . . .

New Industry to Wyoming

In 1955, when the local refinery closed down, Glenrock, Wyo., became a town without a pay roll. Something had to be done. Rumor had it that Pacific Power & Light was studying locations for a generating plant. A group of Glenrock citizens raised money to go to see Paul McKee in Portland, to urge that the PP&L plant be located in Glenrock. On hearing of the group's proposed trip, McKee sent back word to hold off. He would go to Glenrock.

When McKee and his staff met with the Glenrock committee, it truly appeared that Glenrock would be a fine site—ample land, adequate water from the North Platte, rail and highway transportation facilities.

But how about a fuel supply?

A History of Coal

Before the turn of the century, Glenrock was a mining town. Glenrock coal was an important factor in the Nebraska fuel market, as well as for the railroads. But by the early 1900s the combination of mining and marketing problems brought an end to mining as the pay roll industry in Glenrock. The Glenrock citizens' committee was undaunted. "There's lots of coal north of town. We don't know how much, but we've seen outcroppings. Perhaps you could send geologists. . ." Glenrock's moxie had paid off. Core drillings in the area indicated by the committee revealed coal seams, close enough to the surface to be worked by the open-pit method. Conservative estimates indicate that there is sufficient coal in the area to supply 400,000 kw of generation for a 50-year period.

The Glenrock find should not have been surprising since Wyoming as a state has abundant energy resources. It is ranked as the second among the states in uranium reserves, fourth in coal, fifth in petroleum and seventh in natural gas.

Two and a half years later the Dave Johnston steam plant stood in final form on the banks of the North Platte—the largest single power source in Wyoming. At the dedication of the plant, PP&L Board Chairman Paul McKee announced that a second 100,000-kw unit would be constructed and placed in service in

The fuel cycle begins with the electric crane loading the 70-ton capacity dump-bottom haulers which carry the coal to the plant site. At the plant, conveyors move the fuel through a series of crushers to the dump storage area at the plant

After the crushing operation, coal is stockpiled, as shown, in the yard. The coal is then conveyed to a secondary crusher, to six silo-type bunkers capable of holding a 24-hour supply. Coal equipment is adequate for two units

About Dave Johnston

W. D. "Dave" Johnston has been in the utility business for 38 years. As an electrical man, he has served as general superintendent for the Natrona Power Co., became vice-president and division manager and director of the Mountain States Power Co., and today is vice-president (retired) and director of the Pacific Power & Light Co. Dave's personal achievements are equally distinguished. He is holder of the Silver Beaver Award, the highest honor bestowed by the Boy Scouts of America. He has served the Natrona County Red Cross for a quarter of a century, and has served as a member of the board of governors of the American National Red Cross. He is past president of the Casper Kiwanis, and the Rocky Mountain Electrical League. He is a director of the Casper Chamber of Commerce, a member of Tau Beta Pi, Eta Kappa Nu, the American Legion and the Elks. Dave has been a frequent author for ELECTRICAL WEST.

Dave describes his retirement as consisting of a little travel and a lot of living. It was interesting to watch the hundreds of ex-Scouts, Red Cross workers, Kiwanians, former employees and friends greet the man, "How ya, Dave?" for whom the power giant had been named. It was a friendly feeling, and comforting to know that the real power at the Dave Johnston plant was Dave Johnston himself.—*The Editor.*

October 1960. This sizable investment in coal-fired generation is typical of the rapidly growing interest in the West's bountiful subbituminous coal deposits in the Rocky Mountain and Pacific Northwest regions.

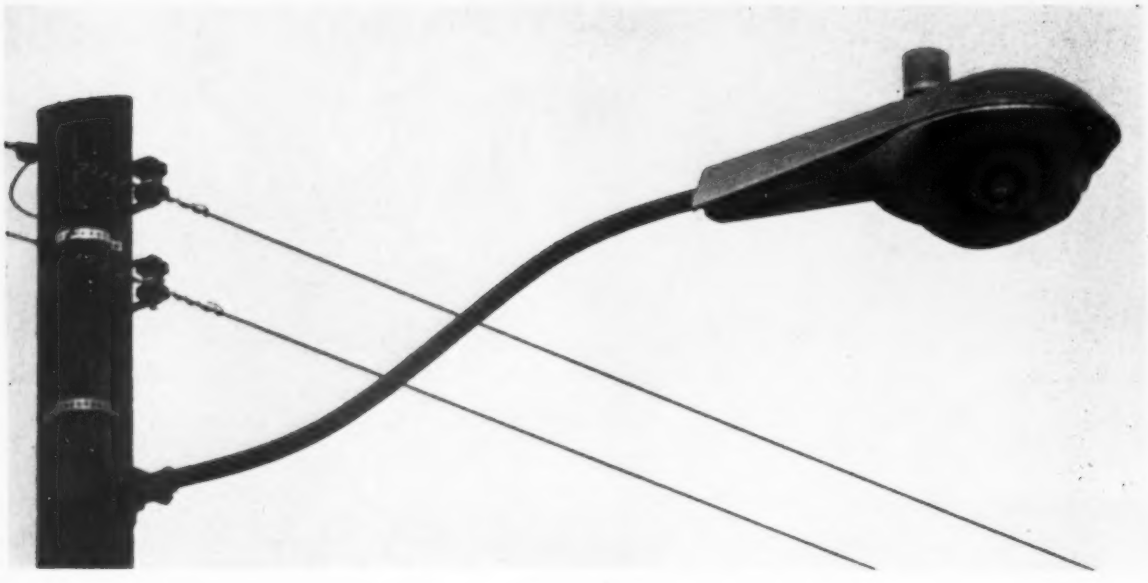
The coal fields are located about 12 miles from the plant, where the coal is recovered from open pits with an electric shovel. The shovel loads the coal into 70-ton-capacity carriers for delivery to the plant over a special downgrade haul road. As the plant grows to its ultimate capacity of 400,000 kw, it may become more economic to supply the plant by rail, and thus the haul road was built to be capable of taking rail equipment loadings.

While present-day economics point to coal as the base fuel, the plant can be automatically converted from coal to natural gas, oil or residual pitch.

The Dave Johnston steam plant was described by Governor Milward L. Simpson as the most significant industrial development in Wyoming in recent years. It is particularly significant to the electrical industry since it points to the broadening influences of subbituminous coal as a source of energy in the Western United States.

December winds failed to daunt visitors who wanted to have a first-hand look at the largest single power source in Wyoming

Dedication day guests were taken in groups of 25 through the new 100,000-kw plant. Here, they look in on the dispatcher for PP&L's Wyoming division



New products, new techniques enable PG and E to . . .

Streamline Street Lighting

G. A. Trosper, Chief Street Light Engineer, Commercial Sales

K. M. Sather, Electrical Engineer
Pacific Gas and Electric Co.

Sweeping revisions in Pacific Gas and Electric street lighting standards point to better community lighting with the attendant advantages of greater safety, less crime and a more favorable business atmosphere.

Much credit is due the manufacturers of street lighting equipment whose efforts to develop new units have made possible today's better lighting job.

Photoelectric Control

The most significant departure from past practice is the extent to which individual photoelectric controls will be used on multiple circuits. The multiple standards call for the use of multiple circuits wherever there is not adequate existing series service. This generalization overlooks special conditions where the economics may dictate series service. Photoelectric relays will be installed on multiple services wherever there is not existing pilot wire control. *These ground rules point toward photoelectric controlled multiple service for approximately 75% of new lights!*

The decision to go to separately controlled luminaires hinged on tests of the photoelectric relay – and to the redesign of luminaires to house built-in ballasts and to accommodate the relays in the hood.

The company's Bureau of Tests has conducted an investigation of tubeless-type photoelectric relays to determine the operating characteristics of these devices. In addition to accelerated life tests, units were calibrated to a predetermined foot-candle value in a calibration cabinet and then rechecked to determine operating characteristics under actual variations of daylight. Results of these tests showed that the devices would vary only three to five minutes from first to last operation. This performance is considered satisfactory for switching individual luminaires.

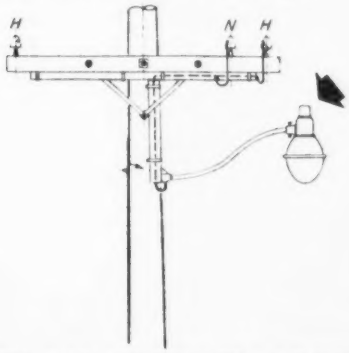
In this regard the question of life of the relay arises. National experience has shown satisfactory life for five years; and it is expected that life will be extended considerably beyond this time. The maintenance program that develops will be handled economically at the time of relamping.

Coupled with this development, manufacturers have standardized on a hood-mounted luminaire receptacle for the relay and have built in the ballasts on mercury luminaires. The result—no special street lighting circuit, no pilot wire, no separate mounting and connection of ballast

Crowded poles emphasize the need for simplified street light construction. Here the use of individual control avoids the stringing of a control circuit

or photoelectric relay. These simplifications should result in cost savings, but at this time savings are indicated, not measured. A surprisingly eloquent confirmation of our anticipated saving was voiced by a lineman after completing actual installation of individually controlled luminaires. He said: "The usual street lighting installation is three climbs—one to put the circuit in, one to mount the luminaire and the third to make connections. Now it means only one climb and when you're all done, you throw your hat over the gadget on top and if the light comes on, you did it right."

The inherent simplicty of the individually controlled street light has



This sketch, copied from PG and E standards, shows the trim appearance and great simplicity of the separately controlled incandescent unit. Arrow indicates the location and mounting of the relay

a bonus advantage for all concerned: appearance. This is particularly important in new subdivisions.

Lamp Developments

Concurrently the makers of mercury-vapor lamps have offered lamps with improved life and higher intensities.

Higher intensity mercury vapor luminaires for street lighting have been recognized in the revised standards. Luminaires for use with 700-w and 1,000-w lamps have been specified in addition to the newly designed units for 400-w lamps. An installation of individually controlled 400-w mercury-vapor units has been installed in San Rafael. These units were specified to avoid the stringing of a control circuit over bad tree conditions and replacing crossarms on already congested poles. Another recent installation of mercury vapor luminaires of this type has been made in Campbell, near San Jose. Performance of these two installations and several trial installations of individually controlled incandescent units has been excellent.

Puget Power Tries Stubbing With Steel

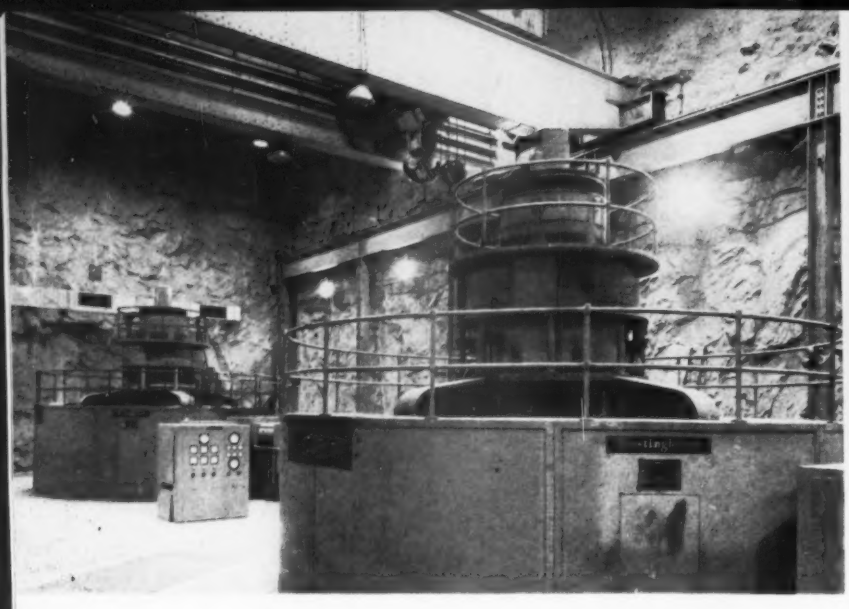
The operating department of Puget Sound Power & Light Co.'s southern division has developed a method of using a portable pile driver and a steel I-beam to stub a pole in 15 minutes.

The driving is done with a truck-mounted Vulcan portable pile hammer which produces a thrust of 186 ft lb at 303 impacts per minute. The hammer is driven with a portable air compressor which has a capacity of 90 cfm at 100 lb of pressure.

Driving of a 10-ft. length of 8-in.-wide-flange galvanized I-beam into the ground requires only 5 to 15 seconds, after which the beam is fastened to the pole with bands installed by a hand-operated banding machine.

Above, a steel I-beam is temporarily fastened to a pole that needs to be stubbed. A truck-mounted pile driver is positioned and, below, actual driving requires only 5 to 15 seconds

Above, the beam is banded to the pole with a hand operated banding machine. Below, in short order the faulty pole is given a new lease on life



Left: Haas power house, Units Nos. 1 and 2. The first U. S. underground power house in 30 years. Above: Equipment for Haas power house was brought in through the tail race tunnel. With plant in operation, the steel catwalk provides access

PG and E uses a mountain for penstock and power house. Here's how civil economics affected . . .

Construction on the Kings

The cathedral-like power house on the cover of February's ELECTRICAL WEST was more than the first large scale underground power station in the U. S. It was that—yes—but much more.

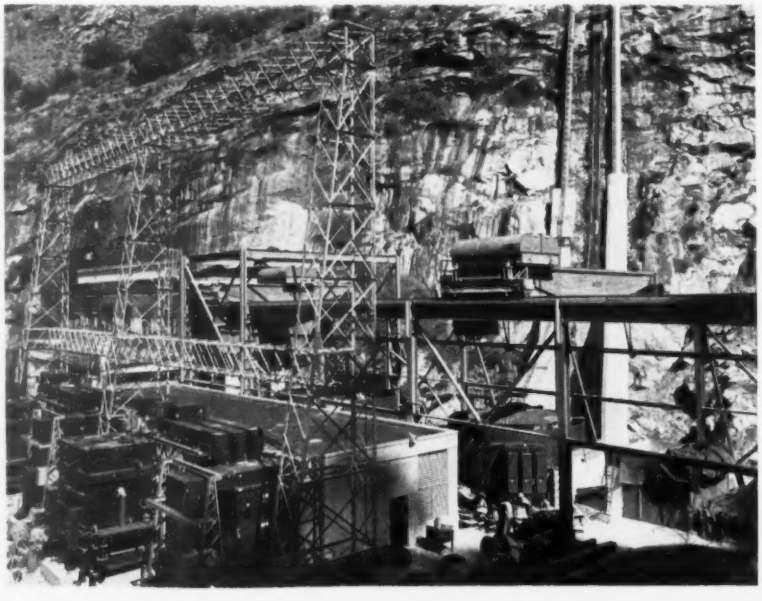
It was a prime example of how far sighted civil engineering practices can bring today's less favorable hydro sites into the economic ball park. The broad outline of the Kings development appeared in ELECTRICAL WEST, December 1955.

When PG and E completes the construction of the Kings River power house at the foot of the Kings River chain of dams, full use will be made of more than a mile of hydraulic head.

In casting the civil engineer as the hero of the Kings River development, we are not detracting from the electrical or mechanical achievements but merely pointing out that the present-day Kings River development might not have been economically feasible if conventional civil techniques had been employed. This point is made because the future of much of the hydro potential in the Western United States and Canada is more dependent upon the skill and ingenuity applied to the economic development of the increasingly difficult sites.

Underground Station

Consider the underground power house. Three of the first six underground power plants in the world were American. They are Snoqualmie Falls, Wash., 1898; Fairfax Falls in Vermont, 1904; and Spaulding in



Outdoor units Nos. 2 and 3 at Balch power house will add 94,000 kw to Balch's capacity. Penstocks in the background are 4,943 ft long, pass under the river to the turbines

A truck dumps loose rock in construction of Wishon Dam, as two monitor jets wash fines to improve rock contact, reduce settling

California, 1917. Haas power house is the first American underground station since 1917 and the first station (128 mw) that can be called large. Why did 30 years elapse with no new underground plant in the U. S. while more than 100 were constructed in other countries?

The underground plant uses less concrete and steel than its surface alternate, but requires more labor. In foreign countries low-cost labor and the scarcity and high cost of materials has made underground schemes more favorable.

The special circumstance that made the Haas plant economical was the topographical situation, which would require a lengthy run of 2 in. to 3-in plate thickness penstock on the lower end of its 2,450-ft head. In addition to this, the underground station offered about 30 ft more of effective head. Here's how the economics work out.

The Cost Picture

The installed conduit cost of the underground penstock and tailrace tunnel was about $1 million less than the cost of the 3,100 tons of conventional penstock that was eliminated. However, the underground power house cost more than its surface alternate. The savings in head are due to the tailrace tunnel losses being much lower than the losses in the high-velocity penstock it replaces. The net capital and power benefits were about $1 million, half of which represents the increased power benefits.

Interesting economies in the underground installation itself are: the sharing of penstock stresses with the granite rock; the use of the tailrace tunnel for permanent access and ventilation; the use of a gunite rool and natural rock walls in this chamber; and the "borrowing" of the two 135-ton bridge cranes from another power house.

Lower-Cost Dams

Wishon Dam and Courtright Dam upstream from Haas are rock-filled dams among the highest in the country. Early estimates of the cost of a concrete gravity dam at the Wishon site indicate that the Wishon rock-filled structure was half the cost. By design changes from previous dams and simplified construction procedures, PG and E engineers were able to improve their cost position without affecting the safety of the dam.

Construction techniques played an important part in raising the Balch diversion dam to give greater effective head to the Balch plants. The original dam, a 93-ft arch-type dam, was thickened and finally raised 45 ft in two successive building seasons. This undertaking, which was contemplated in the design of the dam, required special measures to bond the old and new concrete. Prepakt Concrete process were used to minimize shrinkage of the new concrete. Shaved ice was used in the preparation of the grout to maintain temperatures of the new concrete as close as possible to that of the existing concrete.

The use at Haas of an underground intake at the dam, a fully unlined tunnel, a rock storage trap and an unusual gallery surge tank made maximum economic use of the granite mountain.

The new techniques in civil construction now proved on the Kings will have a continuing effect on the economic feasibility of hydro projects throughout the West.

To fully utilize potential head, Balch forebay dam had to be thickened and raised during two successive construction seasons

A new product solves old problems, points to . . .

Reduced Modernization Costs

Philip J. Larscheid, Electrical Job Engineer, Bechtel Corp.

Westvaco Mineral Products Division of Food Machinery & Chemical Corp., located at Newark, Calif., was planning an addition to its plant. Before the electrical installation was started, a cost comparison between wire in rigid conduit and aluminum-sheathed cable was requested.

The cost analysis (see box) indicated the possibility of *saving one-third over conventional* methods.

These costs were broken down between labor and materials. It was found that the labor cost for the conduit and wire installation was 113% higher than for aluminum-sheathed cable, while the material costs were nearly equal.

Reviewing these findings, it was decided that aluminum-sheathed cable was to be used for the electrical installation.

Sheathed-Cable Characteristics

Aluminum-sheathed cable has been used for years in Europe. Depending on the process, the sheath is swaged or extruded around the conductors. The cable needs support every six feet. It has a minimum bending radius of five times diameter eight to 12 times for rigid or armored cable conduit. Cable diameters to .640 in. can be formed by hand, making for neat appearing work. The conductors were color coded.

How It Saves

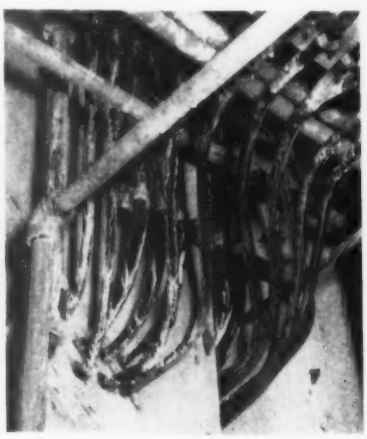
An analysis of costs shows that the big saving comes in the labor of installation—even though material costs are slightly higher. This grows out of the fact that the installation is more similar to running non-metallic cable in residential practice than the usual installation of conduit followed by wire pulling. The sheathed-cable job has:

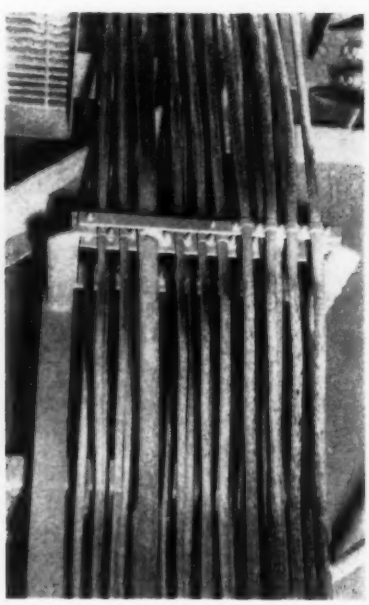
- No wire pulling
- No cutting, fitting or threading of conduit

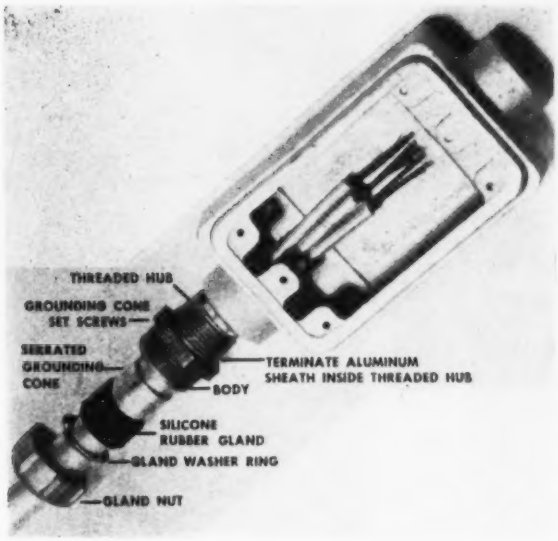
Comparison of Wiring Methods

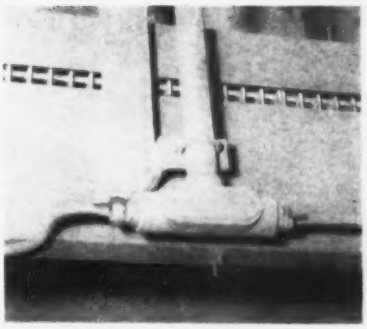
Method	Cost Breakdown Labor %	Material %	Total Cost Conventional Method %
1. **Conventional installation** using conduit and wire. Supports for conduits included	66 2/3	33 1/3	100.0
2. **Aluminum-sheathed cable** supported by trays required for supporting cable, but not required for conduits	40	60	65.0
3. **Aluminum-sheathed cable** supported on conduit supports	48	52	63.5

Left: Sheathed cables drop easily from tray to tray. Center: Big savings made in running cable through existing walls. Right: Three tier support holds the cables on a vertical run









Left: Exploded view of the special connector required for use with the sheathed cable. Picture at right shows the prefabricated lighting stanchion with condulet connection at the base, as well as the condulet with six conductors incoming and three each outgoing to push button and to molder. Joints are rubber-wrapped and glyptol-painted because of corrosive conditions

- No limitation on the number of bends per length
- Minimum waste if runs are carefully figured
- No problems of wire damage during pulling or moisture in conduit

With most runs unbroken from source to control or utilization device, it is easy to see where the saving comes from.

Special Considerations

Connection of the sheathed cable to terminal boxes had to be achieved by special connectors (See cut.)

The cable connector is similar in appearance to the compression connector used with electrical metallic tubing. It is made up by inserting the cable through a clamping nut and rubber gland, into a split sleeve compressing fitting. When the three set screws are tightened, they force a split sleeve compression fitting against the aluminum sheath, thus forming a complete bond between connector and sheath.

To fit the various cable diameters, eight different sizes of cable connectors were used. One size hub was established to facilitate a uniform hub size for all conduits and push buttons.

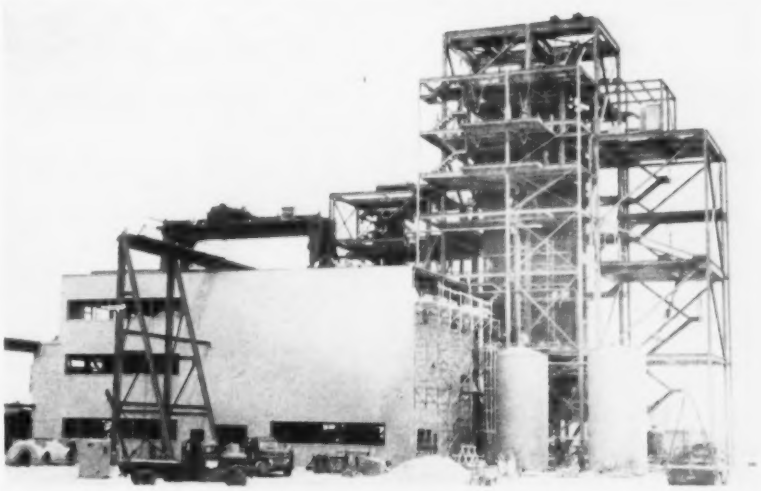
On the particular job in question, it was necessary to coat the sheath with a rubberlike compound since the product of the plant and aluminum reacted chemically. This would not normally be required.

The cost of the sheathed cable does place a premium on careful layout to eliminate overpurchasing. Out of the 18,000 ft of 2-, 3-, 4- and 6-conductor cable varying in wire size from No. 14 to 500 mcm, only 1,100 ft of 3/c-No. 12 were left over. This overage was recovered by selling to another job. A less popular size would have presented a problem.

Cable Reusable

Whenever changes are necessary, removed conduit and wire are a total loss. On the other hand, lengths of used sheathed cable are economically reusable even where splices are necessary.

This new material certainly deserves a hard look on any industrial wiring or rewire job.



PUBLIC SERVICE CO. OF NEW MEXICO, in the construction of its Reeves station, anticipates a 15% saving through the use of colored aluminum insulated sandwich walls. The walls are made up of an interior sheet of aluminum, one inch of fiber glass insulation and an external sheet of green embossed aluminum. Each wall is secured to the building by end-welded stainless-steel studs. Within the plant, similar end-welded studs are bringing about savings by securing insulation covered with aluminum lagging to the pressure casing of the boiler. Stearns-Roger Mfg. Co. developed and tested the insulating method

One man feeds three 50-mcm conductors into a manhole for an 820-ft pull

Adhesive applied to a tee-splice of the 500-mcm aluminum cable after wrapping

Light and Easy to Pull

Savings both in labor of installation and in the conductors themselves were reported by Pacific Electrical & Mechanical Co. Inc. and Rosendin Electric Co., a joint venture, in the U. S. Naval Industrial Reserve Ordnance plant in Sunnyvale. It was one of the largest installations of high-voltage aluminum cable in Western industry. Instead of posing any problems it speeded the job.

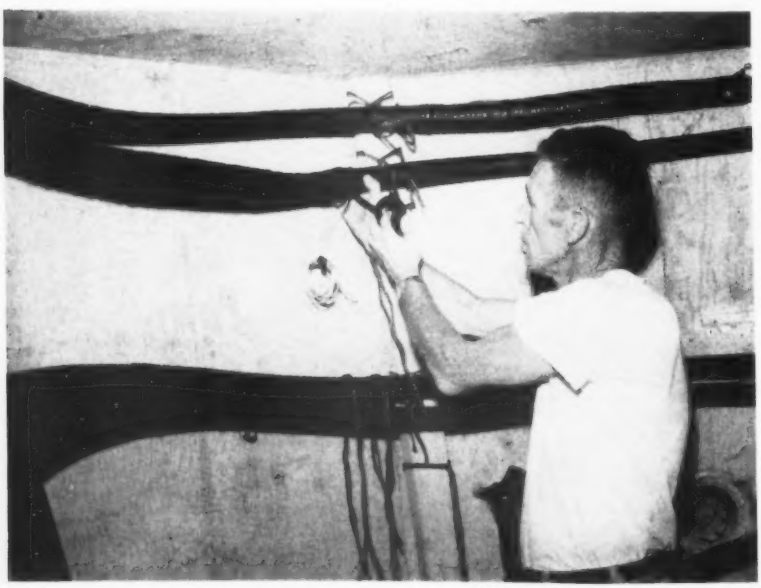
In addition to savings gained with a more economical metal, the 50% lighter weight of the cable made it easier to handle and install. The contractors report a factor of 10 to 15% savings in man-hours.

Roy Rosendin, vice-president of Rosendin Electric, San Jose, said, "Although this was our first experience with this type of aluminum cable we had no difficulties and our men were very impressed with it. It is lighter and has less friction drag so we found it easier to pull. We used small fork lift trucks to move the 60-in. spools. The splicing is the same as with copper."

Longest pull was 1,085 ft between the plant's rectifier station and a manhole in the Navy building. A total of 180 splices was required for the job. These were protected with ozone-resistant neoprene tape with a final serve of friction tape and a coating of weatherproof paint. Terminations were made on switchgear equipped with compatible aluminum terminals.

The cable was used for feeder circuits in a 12½-kv ungrounded neutral system in the ordnance plant adjacent to Lockheed's missile systems division plant in Sunnyvale, where the Navy and Lockheed are working to develop Polaris and other missiles.

More than 26,500 ft of 500 mcm aluminum power cable, Kalzone butyl insulated, aluminum shielded, neoprene sheathed, was used. It was made at Kaiser Aluminum & Chemical Corp. plant at Bristol, R. I. The main feeder was 750 mcm. Others used were 350 mcm and 4/0. High-voltage tests by an independent agency showed a leakage of only .06 mc at 40-kv, d-c, on all three circuits.



Temporary supports hold cable while splices are made and then wrapped

ELECTRICAL WEST
Construction News

For
- contractors
- consulting engineers
- lighting engineers
- wiring designers
- distributor salesmen
- all interested

New codes

Salt Lake County Commission gave approval to a new electrical code, effective March 1, after two years work on one. R. Kendall Williams, former inspector for Salt Lake City, was appointed chief electrical inspector. No license to do electrical work will be issued without a $1,000 bond. The code is similar to that in Salt Lake City.

Neighboring Orem, Utah, has also passed a new electrical code, which will require 1¼-in. conduit and 100-amp service for all residences of 900 sq ft and over. Passed last November, it is now in force.

A bill (HB 152) to create the office of state electrical safety inspector to be appointed by the administrator of contractors was put before Utah's legislature by former Mayor Glade of Salt Lake City at the behest of L. M. Christensen, Salt Lake City inspector. A separate state electrical inspection and code bill, twice before introduced, having narrowly missed passage, this new endeavor was linked to the contractors' licensing act passed last year. Left-handedly it provides that "minimum standards of safety for electric installations and wiring" be set up by this man. Also that he be empowered to inspect all electrical installations on publicly owned or tax-supported properties (now exempt from city inspection).

To train and retrain

A manpower training program has now been incorporated into the union-contractor agreements in northern Utah and eastern Idaho by IBEW locals and Intermountain Chapter, NECA. It includes Pocatello, Idaho Falls, Boise, Ogden, and may soon include Grand Junction. Salt Lake City's local is still a holdout. A similar agreement applies in the Intermountain Line Constructors—for Wyoming, Colorado, Utah and Idaho (but not Montana) since Sept. 1, 1958. A fund is being raised to finance apprenticeship and all phases of training by a 6/10 of 1% labor pay roll tax. When enough is raised, a training coordinator will be hired and the training itself begin.

Fly in to the Glacier Park NECA Tri-District 6, 8 and 9 annual meeting June 22-24. Western Air Lines proposed to the Feb. 2 District 8 meeting in Salt Lake City. Plans are under way for an outstanding meeting and many tours.

Togetherness

An interindustry relations program has been initiated by the Salt Lake City group of the Intermountain Chapter of NECA. It is being followed by the Ogden group, which held its initial guest day with architects Feb. 3. Salt Lakers have met with electrical engineers, Feb. 23, and prior to that suppliers and manufacturers. As guests of members, better understanding is fostered and the NECA programs of estimating, business training and market development are discussed in relation to the other branches of the industry.

Medallion Homes in Idaho Power Co. areas made an exceptional record in proportion to population and new homes built. The year 1958 saw 46 Gold Medallions (all-electric heating) and 218 Bronze given to proud homeowners.

Spring blossoming

An outdoor living program, sponsored by the Salt Lake Tribune is going to be "electric living" if Vern Sharp, Sharp Electric Co., has his way. And, since he made it so last year, his prospect is excellent. The newspaper promotion is backed by the Chamber of Commerce and Utah Power & Light Co. It will start early this year—March 13-14—"Spring Downtown Days." Display of all kinds of outdoor living equipment will be featured in windows and a special spread at Utah Motel. Outdoor electric lighting and cooking will be strongly dominant, Sharp promises.

Perpetual emotion

Negotiations on wage increases are going on (do they ever cease?) In the Boise area where the local is asking a big bite—50¢ an hour increase. The union later compromised on 26¢. But Boise is not alone—Pocatello has the same annual hassle, there 40¢, plus more health and welfare. The case may go to the Council. . . Seattle is in negotiation too, with the union asking a 50¢ increase and more health and welfare and less work.

Pacific Electric Motor Co. which a year and a half ago built a small office and warehouse in Pittsburg, Calif., has expanded the operation to a shop, warehousing and engineering facilities to operate as a branch of the Oakland headquarters, W. E. Boyd, president, has announced.

Bids fair to succeed

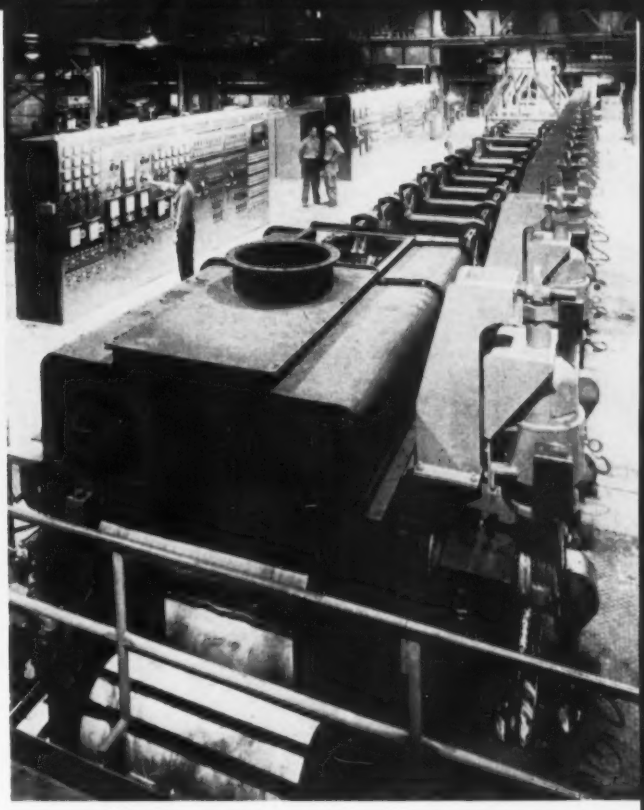
The bid depository serving the Alameda, Contra Costa, Napa and Solano Counties area now has enrolled 75% of the total contractors in the area as its membership. An additional information service on charges and alterations to plans and specifications is planned soon.

Electrical Contractors Division of the Bureau of Home Appliances of San Diego County plans a big exposition of electrical materials and built-in equipment such as lighting, heating, air conditioning, etc., in the Spring Fair of Modern Home Ideas April 24.

On committees

Westerners appear often on the standing committees recently appointed by NECA president, Oliver Burnett. On the governmental affairs committee S. I. Jaggar of Portland, C. I. Berrell, Salt Lake City, and Norman Ferguson, San Diego, are named. The line constructors committee includes John S. Clark, Santa Fe; W. A. Soule Jr., Denver; Charles A. Wikle, Los Angeles; and G. B. Schetky, Portland. On the Council on Industrial Relations Charles Scholibo, new NECA staff man in San Francisco; Richard E. Arbogast, Los Angeles, and Robert L. Wilkinson, Spokane, are named. The manpower development committee (apprenticeship, etc.) has on it S. S. Adams, Portland; J. A. Simpson, Cheyenne; and Irving Butcher, San Jose. The marketing committee includes Howard E. Bayley, Seattle; C. H. Simpson, Cheyenne; A. L. Berg, Los Angeles; and George B. Schetky, Portland. The research committee has on it L. M. Stewart, Spokane; W. P. Robbins, Salt Lake City; and Karl F. Stolting, Santa Rosa. On the National Employees Benefit Board W. R. Grasle, Portland, A. L. Rowe, Great Falls, and J. D. O'Connor, Sacramento, are members. On the codes and standards committee Sidney F. Hill, Los Angeles, Karl Krummel, Denver, and Gordon Smith, Spokane, are named. Clyde L. Chamblin, past president, San Francisco, is on the President's Advisory Council.

Above—Relay and contactor panels were preassembled and then installed, using ventilated wire troughing on the board and cable trays above to carry the immense volume of control wires



Left—Cleaning and plating tanks through which steel strip speeds at 1,250 ft per minute. Stainless steel control panelboards contain interrelated automatic control of the entire line

U. S. Steel—Columbia-Geneva requires minute control of heavy amperages to coat . . .

Tin Plate at 1,250 Ft Per Minute

Increasing need for tin cans for the West's fruit processing and other industries has brought about the need for increased production of tin plate. To meet that need and provide for the future growth a third and a more productive Ferrostan, or electrolytic tinning line, has just been completed at Columbia-Geneva Division of U. S. Steel's Pittsburg, Calif., plant.

As with the two previous lines, the electrical installation was made by Fischbach & Moore. Unlike the two others, however, the latest line involved a far more intricate control system as well as exceedingly heavy facilities for the power demands to meet the design speed of 1,250 fpm.

Accompanying pictures show some features of the electrical wiring installation, particularly the heavy copper bus bar.

The new and vastly improved line is equipped with automatic closed-loop feedback control systems to regulate and synchronize most of the line's functions. These include modulated loop controls, both magnetic and photoelectric, regulators to govern speed, edge position, tension, temperature and plating current, all synchronized to the speed of the moving steel.

The line employs pin-hole detectors, Beta ray radiation gages for measuring steel and coating thickness, flow line indicators, reflectivity devices for surface inspection and classification.

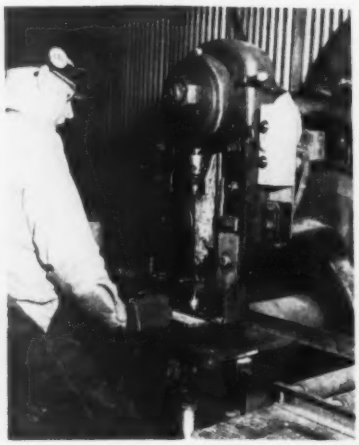
For quality control are electronic memory devices that classify, count and direct the piling of the cut pieces in separate piles. An automatic data collecting system records the results.

Germanium rectifiers are used on this new processing line to provide the heavy direct current for the cleaning and plating. Uniformity of the tin coating is maintained by precise control of the amperage in relation to line speed. A heavy-duty switching arrangement makes it possible to produce plate with different weights of coating on the two sides when specified.

Master control for the line is located at the station on the balcony adjacent to the center section. Here stainless steel panel boards are used to mount the master motor operated rheostats that control line speeds. Three independent adjustable preset speeds may be selected by the operator with push buttons. The master drive is the center section pull bridle, which follows the master motor operated rheostat through the action of the pull bridle magnetic amplifier-type static regulator.

A synchro-tie transmitter is mounted on the drive bridle and a receiver is used as the driving unit of a synchro-tie m-g set, located in the basement. The tachometers on the set furnish speed signals for various regulating and metering functions, such as the chemical treatment rectifiers, differential marking rectifiers, plating rectifiers, electrostatic

Heavy copper bus (½ x 6 in.) was cut like lumber with a power saw. Special clamp was devised to hold it against vibration



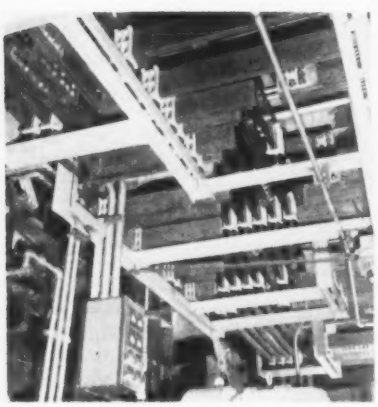
Punch press was used to make bolt holes at ends where bus was to lap and a connection made. All bus was bench prepared

Where some special piece required punching differently this motor-geared, screw-type punch was used as the need for it arose

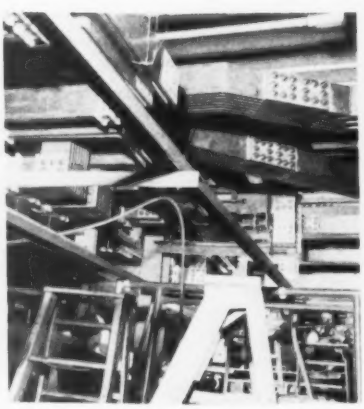
Preparatory to plating the contact, surface was buffed clean with an emery disc

Using a small d-c plating kit and a silver solution, the contact surface was plated

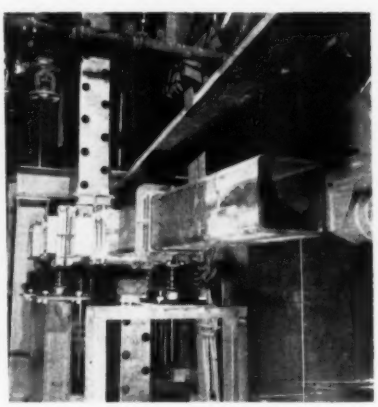
Bends in the heavy copper bar were made at a bench with a rig and long levers



Accurate measurement, punching and bending assured precise fit of complicated bus



Silver-plated contact surfaces assure conductivity for heavy direct current flow



Square tubular bus (8 in.) for the heavy remelt current that brightens the tin plate

oiler, winding reels and the flying shear.

To keep tension on the strip of steel passing through the line, a drag bridle runs at the same speed as the drive bridle. Again a static regulator is used to set the drag bridle tension to maintain the proper pull.

There are four groups of helper motors, located physically between the drive and the drag bridle, which run at the same speed as the line and are likewise controlled through static regulators. These individual motor torques counteract the individual roll friction.

To permit time at the entry end for changing the coils of strip and welding the new coil to the coil in motion and at the delivery or recoil end for the shearing and classifying, a storage loop is maintained in each case. A speed signal from the main section is fed into the entry motor operated rheostat and, in addition, a signal is provided by the Photothyration loop regulators in the storage loops. This signal modulates the speed signal from the main section so that the main and entry section speeds are exactly matched. However, the entry section can be stopped while the main section continues to run to allow for change of coils. During this time the main section continues to take strip from the storage loops. Some 250 ft of uncoiled steel strip is thus stored in two 80-ft looping pits. Tension is maintained through the action of the static regulators.

In the recoiling section the two winding reels and other auxiliary motors also receive their speed reference from the pull bridle in the center section. The operator can transfer the strip from one winding reel to the other on the fly without stopping the center section.

When the tinning section is being operated with the shearing section, the flying shear motor receives a speed signal from the pull bridle as well as a signal from the loop regulator located in the shallow loop between the shear and the tinning section. The action of these two is fed to the flying shear motor through static regulators and maintain the speed of the flying shear and leveler at the same rate as the strip coming out. The shearing section can also be operated independently of the tinning line using previously coated coils of the tin plate from storage. Tha classifier belts that remove the sheared sheets from the flying sheer are regulated by static regulators, which receive a speed signal from a pilot generator mounted on the flying shear.

Most of the steel used ior tin plate at ths Pittsburg plant comes from the Columbia-Geneva plant at Geneva, Utah, in the form of hot rolled steel coils.

The line is supplied with power at the Pittsburg plant comes from at 6,900 v. The high-voltage switchgear feeds two 1,500-kva air-cooled dry-type transformers which, in turn, supply the 480-v power to the tinning line. Resistance-type conduction heating equipment is supplied to reflow the tin to give it its bright surface after the electrolytic plating process. This is supplied by two 1,500-kva askeral-filled, single-phase transformers, each of which is controlled by a 1,500-kva saturable reactor.

Germanium rectifiers supply the direct current for the plating section up to 24 v d-c through bus designed to carry 100,000 amp.

Mott Electric Co., Spokane, installed one for demonstration outside the shop

Some farms prefer a hinged-arm mounting that can be lowered for lamp changing

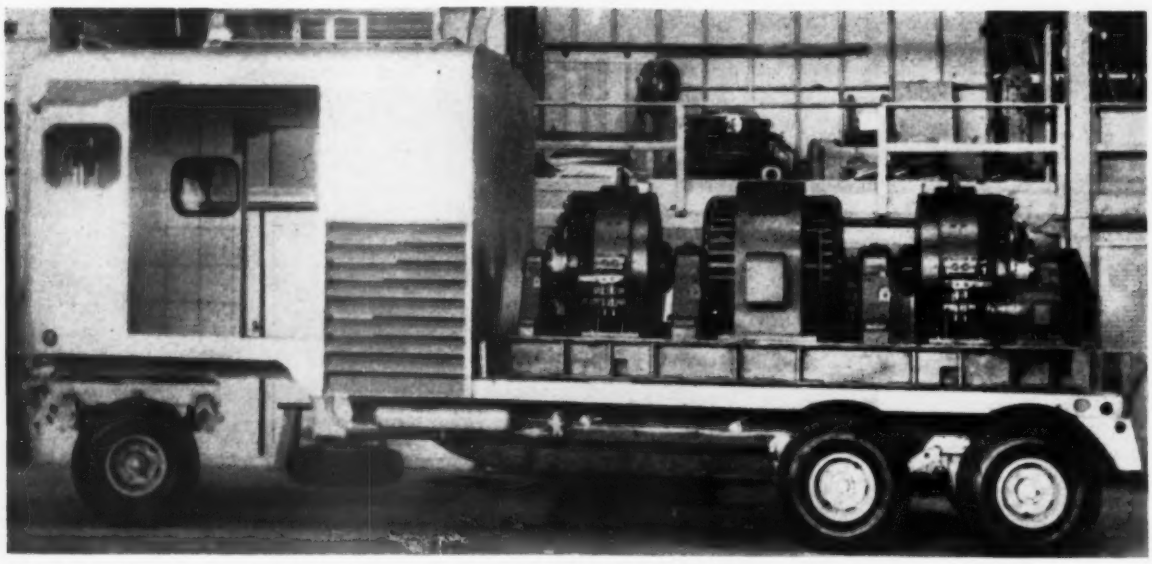
To Each His Own Light

A new and unsuspected market for electrical contractors has been opened up in Washington Water Power Co. area by the promotion and sale and installation of individually owned yard or street or service area lighting units. Included in the package is an automatic photocell switch or time switch to control the lamp without attention from the owner.

While the idea was initiated to sell farmers yard lighting it is catching on and a surprising number of other prospects and customers for the "sunswitch lighting" are being found. The utility is promoting the idea in its Farm News and rural advertising. The farm committee of Inland Empire Electrical League is coordinating the selling effort and contractor-dealers are making the sales and installations.

The typical job consists of a pole, mast arm and lighting unit. Fixtures of Line Material Co., General Electric and Westinghouse are being used, lamped with a 295-w bulb. It costs about $100 for wiring, unit and labor, plus about $20 for a pole. On the pole is also mounted a photoelectric cell switch that turns the lamp on at sunset and off at sunrise and a meter. Sometimes a hinged bracket arm is used where the unit is to be lowered for servicing.

Advantages of the individually owned area lighting unit to the farm are that it lengthens the productive hours on the farm, enhances the value of the property, promotes nighttime safety and discourages vandalism and burglary. Other places than the farm that are finding it protective include private yards, rural store fronts, private lanes or walks, recreation areas, equipment service areas, outdoor storage yards, parking areas and community centers. Washington Water Power Co. expects to sign up about 1,000 customers in the next two years.



Before assembly was complete, portable motor-generator set looked like this. Housing at left is for switchboard

The Case of the Shifting Load

G. H. Feldcamp
Walt Disney Productions
Burbank, Calif.

and

P. BELSKY
Distribution System Engineer
Westinghouse Electric Corp.
Los Angeles

A modern portable power supply for use in motion picture production is being used by Walt Disney Productions. It supplements stationary power houses located on studio property and is ideal for use on remote locations where heavy 125/250-v d-c power required for lighting is not available.

The advent of motion pictures created a demand for powerful light sources and associated power supplies. The d-c arc lamp in ratings up to 35 kw has become a motion picture industry standard, particularly when color film became available. This film requires large quantities of the color corrected light of the arc lamp to illuminate properly the motion picture sets for the relatively slow-speed color film. A standard 125-v d-c generator is used as the power supply for the 85-v arc lamp. Ballast resistors are used in series with each lamp to reduce voltage to the proper operating level and to limit inrush currents when the carbon electrodes are shorted momentarily to strike the arc.

The motion picture industry has standardized upon the use of three unit motor-generator sets utilizing a double-ended arrangement. A synchronous motor drives two 125-v d-c generators connected 125/250 v, three wire, making 125 v d-c available for the studio lighting requirements and 250 v d-c for special effects, motors, etc.

As a result, large power houses centrally located on the studio property, containing as many as five or six 500-kw double ended m-g sets, together with motor starting apparatus, generator control boards and multiple feeder switchboards, are still in service in this industry. Such installations represent a large capital investment in fixed power-generating sources, and switching and feeder facilities are obviously restricted to loads in the immediate area due to low-voltage feeder cable limitations.

When 120-v d-c power loads approaching 40,000 amp can occur on the so-called superspectacle shots, even such power houses are unable to service adequately the movie set and a portable power supply utilizing the same power house-type m-g set — except trailer mounted — was brought into use to augment the fixed generating facilities.

These portable sets justified their investment for a number of reasons. They were available for use in any area where a-c power could be supplied to run the m-g set. Since it is very difficult to find the heavy 125/250-v d-c power required for motion picture service outside the studio lot, the portable m-g set was ideal for remote location work. A-c power is usually available in most areas and, if in sufficient capacity to start and run the portable m-g set, it solves the lighting power supply problem.

No capital investment is required for long, heavy permanently installed d-c feeder circuits as used with a central power house to multiple stage locations. Being portable, the m-g sets are available on a rental basis to other studios when not required for local use. A comparable power house installation has no rental value outside the studio property and may stand idle for long periods of time when not in demand for studio service, tying up land and capital.

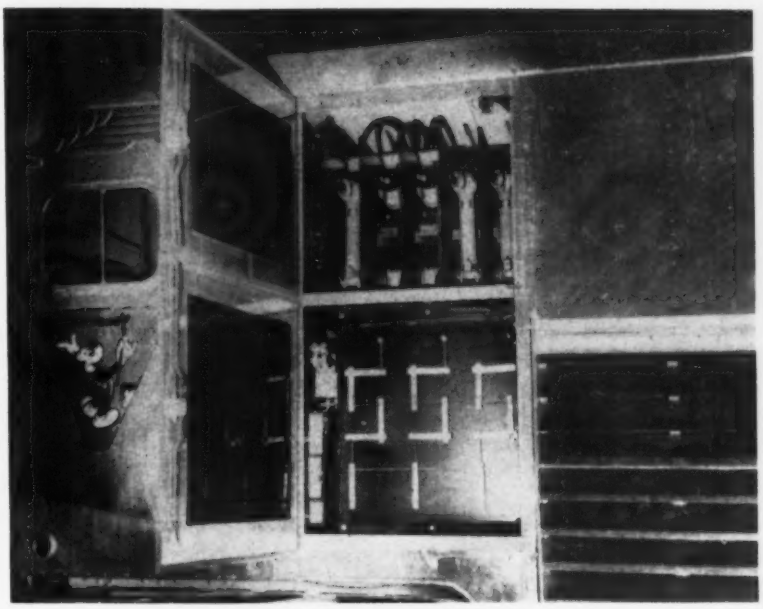
Early Power Supplies

The early portable generator set consisted of a flatbed trailer with wood roof and drop-canvas sides suspended on an open framework, un-

der which was mounted the m-g set, usually rated 150 to 300 kw, together with a manually operated autotransformer 5-kv-class starter, and a d-c generator panel with meters and breakers for minimum generator protection.

Although this type of m-g set answered a definite need for the industry, there were many limitations to its use. While portable, it was difficult to move and had little protection from the weather for the equipment and operator. High- and low-voltage apparatus was open type, live front and live rear for easy accessibility. There was little regard for appearance and safety, thus requiring extreme care in operation to isolate the equipment and protect studio personnel.

Open machines of this type were noisy and had to be located a considerable distance from the sensitive microphones used during picture production.



Current limiting power fuses (top) and motor reactor tap changing board can be seen here

The New Power Supply

Walt Disney Productions undertook to remedy these difficulties and build a modern, portable m-g set that would incorporate the latest equipment designs and be in keeping with over-all Disney practice.

A unity-pf, three-phase, 60-cycle synchronous motor is used. It can operate on 2,400-, 4,160- or 4,800-v lines. It drives two 150-kw, 125-v d-c generators connected for 125/250 v d-c, three-wire service.

The generators and motor are of special design, capable of operating at 200% load for 15 minutes or 225% load for five minutes, to take advantage of the relatively short "on camera" times.

The generators are very flat compounded not to exceed a variation of two volts from no-load to 200% load to prevent voltage variations from affecting the intensity and color of the light source used for set illumination. Voltage regulators are not required. Generator commutator ripple is held to a plus or minus one-half of one per cent of normal rated generator voltage to eliminate a noise phenomenon found in d-c arc lamps operated with an unfiltered power supply.

The m-g set and associated equipment are housed on a drop-frame, three-axle, flatbed 12-wheel trailer within a totally enclosed aluminum housing completely soundproofed so that it can operate within a short distance of a microphone.

Soundproofing consists of a 6-in.-thick wall of a double-layered perforated Celotex with ¾-in. air space between inner and outer layers plus a spray coating for the underside of the trailer. The reduced height area over the front swivel wheels was used for the combination starter and generator control board and arranged to provide an enclosed operation and maintenance aisle. This area is accessible through a hinged door at the end of the trailer and is vented to permit movement of air into the m-g set blower compartment through the control switchboard to keep both operator and switchboard at a comfortable temperature level.

The m-g set itself is mounted on the load bed platform of the drop-frame trailer using a special rigid bedplate to eliminate any misalignment of rotating parts during transport or the necessity for accurate leveling for operation. The aluminum housing over the m-g set area is removable for major repairs or overhauls that cannot be handled through the double door at the rear of the trailer. Vibration mounts beneath the m-g set bedplate reduce the transmission of vibration and noise to the trailer frame during operation.

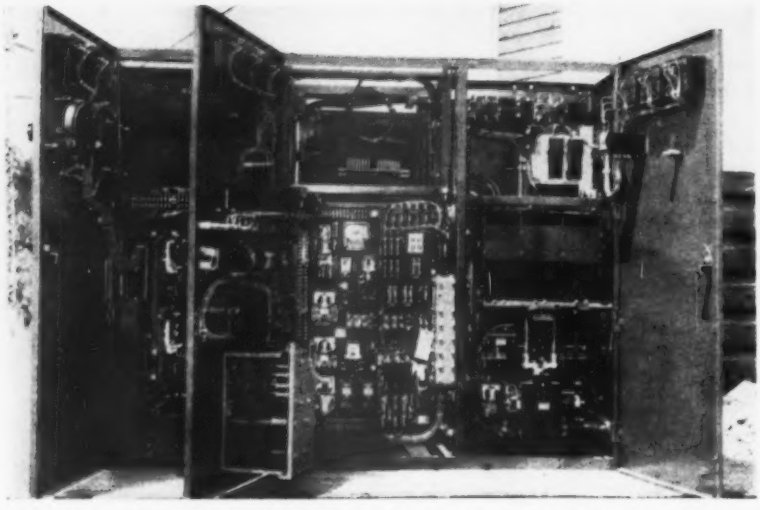
Enclosing the m-g set introduced a ventilation problem requiring the use of a 5-hp squirrel cage blower to pressure the m-g set enclosure. Air is moved up through the rotating machines from a duct system under the trailer that has baffled and filtered intake vents on each side of the trailer housing. Exhaust noise is held to a minimum by using a multiple pigeonhole exhaust duct extending the length of the m-g set area lined with acoustic Celotex and venting out the top rear of the trailer.

A-c power is brought into the trailer by use of a roof mounted, collapsible tripod assembly, which provides convenient connection to overhead power lines and which is stored flat on the trailer roof when the trailer is being moved. An aluminum ladder stored in the trailer provides ready access to the enclosure roof when necessary.

The d-c generated power is taken from a "spider" consisting of three bare copper buses accessible through a hinged side panel on the trailer housing to which the multiple d-c feeder cables are clamped as necessary.

Synchronous motor starting inrush had to be held to the lowest possible value since the m-g set might be moved to an area where available a-c power would not tolerate conventional starting methods. The motor starter had to be suitable for 2,400-, 4,160-, or 4,800-v service to provide maximum flexibility with minimum weight and to fit within the limited space available over the front wheels of the trailer.

A reactor-type starter is used with limits starting inrush to approximately 200% to provide sufficient torque to start and accelerate the set to full speed in approximately 15 to 20 seconds. Motor field is automatically applied by sensitive field frequency detecting equipment so that the machine is synchronized



This photo of the control switchboard was taken before its installation in the trailer

to the line with minimum disturbance.

A special tap changing panel for changing voltage connections on both the shielded three-phase reactor and motor uses movable links accessible behind an interlocked hinged cover on the side of the trailer and operable from ground level. A similar scheme on a 15-kva, three-phase 4,800/230-v auxiliary dry-type transformer with special low-voltage taps provides 230 v on 4,160 v and also 2,400 v primary service. The transformer primary is connected ahead of the synchronous motor starter to supply all control, operating and lighting requirements. A 1.5-kva, single-phase, 120/240-v, dry-type lighting transformer provides fluorescent lighting and convenience outlet power requirements.

Disconnecting type, 5-kv boric acid current limiting power fuses provide 150,000-kva interrupting capacity on 2,400 v, 250,000-kva interrupting capacity on 4,160 v and 4,800 v for starter and motor protection. These fuses are coordinated with the synchronous motor overload relay and current transformer characteristics to permit the motor starter 5-kv, three-pole air contactors to handle all overload and fault operations up to the contactor's maximum interrupting ability without requiring fuse operation.

Since there is no way to check phase rotation of the incoming a-c service when on location, a quick and convenient means was required to permit reversing motor rotation without reconnecting the incoming high-voltage service. This is done by using five boric acid disconnecting-type power fuses, hookstick operated, behind a sliding mechanical interlock. Only three fuses at a time can be closed, depending upon the desired phase rotation. All are accessible from ground level with a short hookstick through an interlocked hinged cover on the side of the trailer housing.

A phase sequence and under-voltage relay monitors the incoming line voltage through the auxiliary transformer and locks out the motor starter with appropriate alarm lamp indication if conditions are incorrect. A "ready" light and an alarm light show the operator what action, if any, is necessary prior to motor startup.

The d-c generator controls include a three-pole, electrically operated breaker plus necessary meters, switches and control devices for proper operation of all rotating equipment. Temperature detectors permit loading the generators and motor to safe operating values without guesswork and machine temperature is under constant supervision by the operator during use.

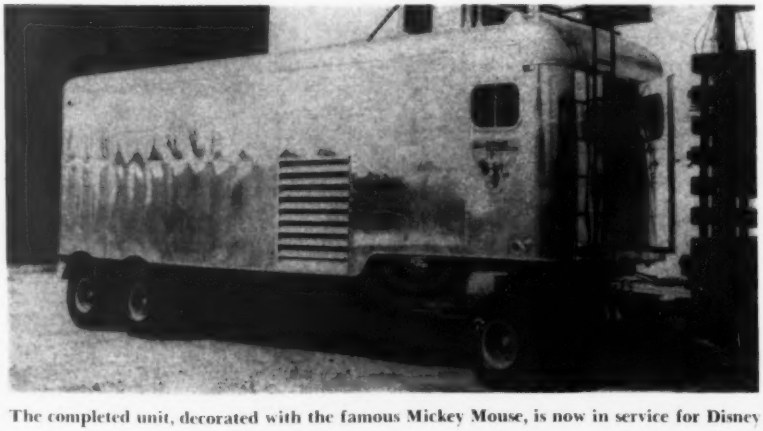
Temperature relays on all four bearings of the double-ended m-g set energize alarm lamps on the operator's panel if overheating occurs. A similar alarm lamp operates if the blower motor is de-energized while the m-g set is running.

All panels on the control switchboard are hinged for easy internal access but interlocked for safety to de-energize all vital circuits if the door is opened. A double-throw field switch for each generator field circuit permits self-excitation in the usual manner or excitation from an outside source to reduce generator voltage from a special remote excitation source for "dimming" for special lighting effects on the movie set.

A weatherproof plug receptacle in the trailer housing permits energizing space heaters in the switchboard from a remote source when the m-g set is not in use.

Weight and size of the completely assembled trailer was a real problem since the California vehicle code limits trailer to 50,000 lb maximum, and trailer and tractor must not exceed 60 ft in length and 8 ft in width for conventional licensing. Otherwise, a special permit with special fees and restrictions is required to move the unit. The assembled trailer weighed approximately 49,000 lb and is 8 ft wide, 12 ft high, 26 ft long, capable of moving at sustained road speeds up to 30 mph.

The soundproofed portable m-g set has so well justified its application for motion picture production that it has replaced the concept of conventional fixed power house installations for large rotating d-c power supplies in this industry. It is possible that it could do the same for others.



The completed unit, decorated with the famous Mickey Mouse, is now in service for Disney

Gordon Black
Rome Cable

T. W. Fuller
PG and E

George Klopp
Hotpoint

Barry McCarthy
BBD&O

Edna Poyner
Norge

Wilks Lambirth
Calelectric

Sales people gather in San Francisco, 375 strong, as . . .

PCEA Section Talks Business

"Let's tackle our problems now." This quote from President Leslie A. Hicks was given to the Pacific Coast Electrical Assn.'s 1959 Business Development Conference by Chairman Gordon F. Black, Rome Cable Corp. Certainly the program prepared by Black and his committee chairmen for the two-day meeting in San Francisco's Sheraton Palace Hotel went along with that philosophy.

Arranged to cover as many of the varied interests as possible in so short a time, the program divided the large group (375 were registered) into two general sessions—commercial-industrial and residential—on opening day, Feb. 12. On the following morning parallel sessions allowed the 10 committees to discuss their individual problems. The entire conference met together for luncheon on Thursday and Friday and for a final session on Friday afternoon.

Citing predictions for an economic environment that would permit an increase in electrical energy sales of 700 billion kwh in the next 10 years, compared with only 325 billion in the past decade, Fischer Black, publisher of *Electrical World*, put realization of this goal squarely in the lap of the electrical industry. If we are to get this business in face of competition, we must continue to sell the use of electricity in industry for all purposes; sell continuity of service and soft pedal power factor, demand factors, voltage control and the like, he said. We must forget the load factors of individual appliances and the buga-boo of selective selling. The trend back toward promotional rates is fortunate, he believes.

Ten rules which he termed "upside-down Hoyle but right-side-up salesmanship" were given by W. Barry McCarthy, vice-president, Bat-

George Rinker
Ramsay

Frank Falge
LBE

John Mead
So. Cal. Ed.

Vic Hartley
PCEA

Fischer Black
Electrical World

C. W. Leihy
Electrical West

Joe Robinson
McKinsey & Co.

V. A. Labarthe
Heating system layouts

ten, Barton, Durstine & Osborn, New York, at the Friday luncheon sponsored by the Home Economics Committee. This talk, "Let's Open a New Deck," (which it is hoped to print in part in a future issue) contained a lot of good sense for salesmen who "play the greatest game of skill and chance." By their power of purchase, women have decided what your industrial as well as your residential load shall be, he said, but fortunately they often do what they say they won't—a recent study showing that 75% of electric appliances were bought by people who at the beginning of the year said they did not intend to buy.

Although President Hicks, who is also president of Hawaiian Electric Co., could not be present to preside at the Friday general session as scheduled, a letter read by Chairman Black brought his greetings.

Hawaii itself was represented by George A. Rinker, manager of W. A. Ramsay Co. and chairman of the Electrical Living Committee of PCEA, Hawaii. With Frank M. Falge, Western manager, Live Better . . . Electrically, and John H. Mead, vice-president, Southern California Edison Co., he presented the afternoon session: "A United Industry Faces Its Problems."

Describing PCEA Hawaii's excellent promotional program, Rinker told how it had paid off in 1958. Appliance installations rose 7.6% over 1957, not including hundreds put in government projects or apartment houses served on the commercial rate. With heaviest competition in water heaters, a total of 5,357 electric units was sold—one for every 18 residential customers on HECO lines.

Stating that Live Better . . . Electrically is definitely continuing through 1959 and will work in close harmony with the EEI program. Falge said that there would be heavy concentration on Medallion Home advertising and promotion and introduction of a complete program for Modernized Medallion Homes. Western utilities have reported installation of 13,880 Bronze and 1,525 Gold Medallion Homes, he said, and their 1959 objective is 20,927 Bronze and 3,876 Gold homes.

Edison Electric Institute's all-electric living program being launched this year will put $3 million to work selling appliances, wiring and lighting, Mead said. He and Don Willis, Arizona Public Service Co., represent the West on the EEI committee for this national umbrella program. (See EWEST, January, p 47, for details.)

Safety measures to avoid electrical hazards were demonstrated by George Gibson and Warren Siler of the Elkhorn 4-H Club, Monterey County.

Presiding over the Thursday group meetings were: Harold L. Moore, Southern California Edison, commercial and industrial, and E. W. Meise, San Diego Gas & Electric Co., residential. Wilks F. Lambirth, California Electric Power, section vice-chairman, presided at Friday's luncheon.

Following are brief reports on committee sessions.

Committee Chairmen

Following are chairmen and vice-chairmen respectively of the committees: *Heating and Air Conditioning*—T. W. Fuller, PG and E; R. V. Southworth, Sues, Young & Brown; *Commercial-Industrial Lighting*—George M. Baker, Graybar; J. D. Whitnell, Arizona Public Service; *Power Utilization*—Howard S. McGriff, PG and E; John R. Parker, Southern California Edison; *Commercial Cooking*—George A. Klopp, Hotpoint; Otis R. Monroe, Edison; *Commercial-Industrial Wiring*—John H. Sargent, U. S. Steel; Lee S. Prince, Westinghouse Supply; *Home Economics*—Edna Poyner, Norge, Evelyn Conant, Edison, co-chairmen; *Kitchen and Laundry*—L. H. Shaff, Arizona Public Service; Frank Falge, LBE; *Residential Wiring*—Dick Riley, Anaconda; John R. McNeese, California Electric Power; *Residential Lighting*, Alan J. McCutcheon, San Diego Gas & Electric; William J. Barton, G-E Lamp Division; *Agricultural Electrification*—*F. C. Miramontes*, PG and E; R. R. Whittaker, California Electric Power.

Commercial—Industrial

Heating and Air Conditioning

The sale of a heat pump, just as the sale of any other electric heat, keeps gas out in the street. This point was emphasized by M. B. Osborn, counsulting engineer, Los Angeles, in a talk before the heating and air conditioning committee. Osborn said 10,000 heat pumps will be sold in southern California in 1959.

Before the same group, F. R. Simonson, consulting engineer, San Francisco, discussed the pros and cons of resistance heating in commercial and industrial installations.

Cost of energy is the foremost reason why people do not use resistance heating except in very special cases, according to Simonson. He compared costs of getting 1,000,000 Btu with natural gas on an interruptible rate with achieving the same amount of heat with resistance heating at 2¢ per kwh. The difference was some $5.50.

Economies of insulating homes were described by Nelson Best, Johns-Manville Sales Corp. Closer temperature control, savings in heat cost and fire protection were the three principal advantages of insulation, according to Best. As a thumbnail guide, he said it takes three to four years to pay for residential insulation in areas with a short heating season, one to two years in areas with a long heating season, and that insulation of a duct system would pay for itself in one year.

K. S. Geiges of Underwriters' Laboratories Inc., in discussing safety design aspects of electric heating, told the group:

"The development of requirements for electric heating appliances has occurred over a long period, so that field experience has brought about practical test criteria that are available to the designer of new equipment. The result is a variety of electrical heating from more than 100 manufacturers that are serving the public need for a maximum of safety."

He then described the UL tests made on nine different types of heat-

ers or heating systems before they received the UL label.

"What does it cost to operate a heat pump?" To answer this question, the San Joaquin Valley Division of PG and E conducted a survey that was described to the group by George Zelhart. For details on the results of the survey, see ELECTRICAL WEST, August 1958, p 76. While the conclusions reached are open to individual interpretation, heat pumps appear to have gained a substantial acceptance within the industry.

"Heating System Layouts," a panel composed of J. C. Beckett, Wesix Electric Heater Co., V. A. Labarthe, Westinghouse Electric Corp., and R. F. Page, Thermador Electrical Mfg. Co., composed layouts for four types of heating systems for the group to see and discuss. Clearly indicated is the fact that flexibility inherent in types of electric heating equipment are adaptable to a variety of conditions.

Commercial-Industrial Lighting

Brief interpretations of some aspects of the Blackwell Report were presented by J. R. Jones, Westinghouse. He emphasized that the Blackwell recommendations open the door for more money for everybody concerned with lighting and lighting loads, if they are properly used. Because of the complexity of the report, Jones recommends that PCEA sponsor classes that would be taught by men who have gone through the necessary painstaking analysis and interpretation of the report. Using this means to speed up intelligent use of the recommendations would simultaneously speed up the development of the higher traffic potential.

Bob Huff, substituting for E. E. McDonald of California Electric Power, who was ill, presented a report on various lighting courses conducted in California and Arizona over a period of approximately two years. There have been some 15 different classes or courses conducted by various associations, utilities and manufacturers, and in addition lighting courses for credit are offered by the University of Southern California, University of California and Arizona State University.

Members of the lighting committee were told that the modernization market deserves more attention, and that an important segment of this market is relighting of office space.

O. R. Monroe D. W. Grosshandler
Barometer for sales effort

F. J. Bertolone of All-Brite Fluorescent Fixtures Inc. and Dudley Moore of Benjamin Electric Mfg. Co. reported on a study of relighting that showed that modern lighting sells office space. Yet to be convinced of this are real estate groups and management groups, and they suggested that this be done via an electrical industry sponsored education program.

Members of the commercial-industrial lighting committee heard R. L. Sawyier Jr. of PG and E and J. K. Schrieber of General Electric Co. describe how a mobile lighting exhibit, plus one-day refresher training courses for contractors held in various communities in California, was a successful aid in selling store lighting.

Power Utilization

Application of fused metal-clad load interrupters to industrial and commercial loads was discussed by C. H. Baker of S&C Electric Co.

This type of equipment consists of load interrupter switch and the high voltage power fuse, and when it is applicable it results in impressive money savings.

Baker said, "Because of the simplicity of design and reliability of operation and inherent safety to personnel, fused metal-clad load interrupters are specially suited to industrial and commercial applications where operating personnel may not have the technical background or the experience to operate and maintain more complicated equipment."

J. Arthur Wells of Artwel Electric Inc. described a recent development in low-voltage motor control. Developed specifically for pumping applications, a new overload relay manufactured by Rowan Controller Co. has two- and three-link starting overload protection in one compact block, and is designed to resist effects of ambient temperatures. It has what Wells called a "more precise narrow band quick trip time versus current curves of a high degree of reliability."

Design features of low-voltage circuit breakers and their advantages in flexible distribution systems designed for future expansion were discussed by John D. Stolshek, Westinghouse. Dividing his talk into three parts comprised of (1) today's circuit breaker, (2) today's circuit breaker in today's distribution system, and (3) today's circuit breaker in tomorrow's distribution system. Stolshek concluded that the present product is a logical component for the voltage systems designed for flexibility and for the future.

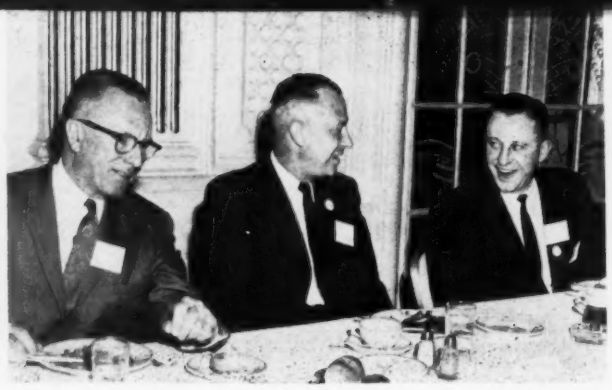
Chain stores are in the vanguard of constantly increasing loads of retail outlets, and Robert B. Liles, architect and engineer, urged early cooperation between utilities and design engineers to arrive at estimates on load and to permit planning on both sides. In fact, he emphasized that the contact be between the utility and the design engineer, not the building owner.

Roland Fellows of International Business Machines Corp. presented the "Electrical Specifications of Digital Computers" in order to show why electrical systems should be designed with the functioning of the computers in mind. More on this subject will be written for ELECTRICAL WEST by Fellows.

"Trends in Commercial Electrical Distribution Systems" was the title of a talk by D. G. Gillham, Dudley Deane & Associates, San Francisco, which is scheduled to appear later in the year in ELECTRICAL WEST.

Producer goods and raw material industries use about half the kilowatt-hours generated in the United States, according to C. L. Phillips of General Electric. The next 10 years will see these industries' gross national product rise some 40% with only about 8% more workers. Phillips said the difference is made up by kilowatt-hours.

To keep up with this remarkable growth, electrical system designs need to be fluid, ever changing, readily adjusted to tomorrow's demands. Phillips used slides to illustrate distribution equipment designed to meet high flexibility requirements.



E. W. Meise, San Diego G&E | G. M. Baker, Graybar | H. S. McGriff, PG and E | F. C. Miramontes, PG and E | L. H. Shaff, Arizona P. S. | W. J. Barton, G-E Lamp

Commercial Cooking

"Electrical equipment manufacturers have kept pace with the dramatic changes in the food service industry, and it is now up to us to see that operators recognize and utilize the maximum potential of electrical cooking 'missiles'," George A. Klopp, Hotpoint Co., declared. He showed heavy-duty equipment that is portable and designed for flexibility and sanitation. Custom-built equipment is offered for operations that have special design or production problems, and electrical controls are being applied even to fuel devices to increase accuracy and efficiency, he said.

"America's First Counter Revolution," a color-sound film, was shown by Kenneth Wells, Wells Mfg. Co., highlighting the built-in design recently introduced and covering engineering, construction and wiring of typical counter top installations.

Discussion brought out the growing utility interest in promoting commercial cooking load; the potential sales opening up through turnover and new business starts in the restaurant field; service problems in outlying communities.

Utilities were urged to make a more concentrated sales effort in the field of commercial electric cooking by D. W. Grosshandler, publisher, Electrical Information Publications.

Illustrating the market potential, Grosshandler said this type of load is being added at an annual rate of about 300,000 kw, which is only 2% of the total potential market. He said the average electric cooking potential per eating place is about 6.4 appliances with a total connected load per establishment of approximately 30 kw. He outlined a direct mail promotion that would cost about $1 per food service customer.

Otis R. Monroe, Southern California Edison, who has headed up an especially effective commercial cooking campaign, reminded the group that operating characteristics of electric commercial cooking offers many advantages, such as good load factor, high diversity, unity power factor, good voltage regulation, off peak operation, good revenue and many customer benefits. His experience revealed the fact that it requires hard sell to accomplish the desired results. About 90,000 kw of commercial cooking load were installed in southern California and Arizona during 1958, which in terms of revenue is about $2,700,000.

Monroe was presented, as a representative of Southern California Edison, a barometer in recognition of the effective sales effort that he supervised. Electrical Information Publications was the donor.

Wiring

Some of the benefits achieved with a commodity standardization program, described by H. W. Christensen, Columbia Geneva Steel Division, U. S. Steel Corp., included the elimination of duplicate and obsolete items, a reduction in purchase costs through buying in standard lots, and increased efficiency through standard specifications commodity codes and nomenclature. Illustrating the effectiveness of the program was that 22% of the items in several commodity classes were eliminated because of duplications and obsolescence.

"The mutual interest of vendor and user are best served by investment in adequate facilities rather than in 'code minimum' or 'dollar engineered' facilities." This was the statement of W. K. Scott, Columbia Geneva Steel Division, as he cautioned members of the committee to avoid the pitfalls of false economy. By evaluating such things as safety, operations, sales, industrial relations, traffic, purchasing, finance, tax and law before making a recommendation, the engineer finds what is really "sufficient for the specific requirement," and the facilities that he recommends are most likely to be "adequate" in the true meaning of the term.

The hazards of dollar engineering and code minimums were further discussed by R. E. Thomas of R. E. Thomas Associates, who has had wide experience in insurance investigation and adjustment related to industrial electrical systems. He related impressive incidents where hip pocket engineering and inadequate wiring, though they cost less initially, were the direct causes of plant shutdowns that cost many times the amounts saved originally. Thomas will discuss in detail the extreme expense of "not enough" in the April Industrial issue of Electrical West.

Solutions to the problems of inadequate wiring in commercial and industrial installations are being sought by a large number of organizations similar to PCEA, and the possibility of the association adopting a "Power-Up for Profits" program was discussed by Lee S. Prince of Westinghouse Electric Supply Co. Prince cited the success of Live Better Electrically and the Medallion Home programs as examples of what might be done in the commercial-industrial field. He said that carrying the message to using customers would require the combined efforts of all segments of the electrical industry, and would bring highly worth-while benefits in return. Prince exhibited a prepared medallion that would symbolize "Power-Up for Profits" in the commercial-industrial field as the medallions do in the residential program. The proposal will be discussed by the committee at a future date.

"A Contractor Views Code Vs Adequacy" is the title of a presentation by Hugo E. Becker of Wismer & Becker, contracting engineers. Basically, his talk pointed out that codes are falling behind technical developments in the electrical industry. He said they must have considerable revision because of radical changes in equipment and materials.

With present rapid changes in types of electrical construction, the codes must take into account the economic factor as well as the capac-

L. A. Prince, Wesco | J. H. Sargent, U. S. Steel | Mrs. Conant, Edison | Allen McCutcheon, San Diego G&E | Rick Riley, Anaconda | J. R. McNeese, Calelectric

ity of wiring and its safety to life and limb.

Agricultural Electrification

Frank Miramontes' agricultural electrification committee began with Dr. G. F. MacLeod's discussion of the business of agriculture and where it is headed. In defining the term "agribizness," Dr. MacLeod pointed to the tremendous impact agriculture has on all of our lives, and showed that by present-day standards a man with a hoe, a mule, an axe and a wife is a farmer not engaged in the profession of "agribizness." He continued to point out the many areas of similarity between the manufacturing and extractive industries and those of today's large, highly efficient farms. Of real interest to the electrical utilities were Dr. MacLeod's comments that the average California farmer uses 17,000 kwh compared to 6,000 kwh for the national average.

R. C. Mueller, Jamieson Laboratories, traced the development of and pinpointed the fact that sprinkler systems were growing in acceptance throughout the West for the simple reason that they produce labor economies in the higher crop yields.

A. E. Hockin, De Laval Pacific Co., brought the group up to date on pipeline milking systems and bulk milk cooling equipment.

H. Naraghi discussed his development of poultry house mechanized equipment, which would enable one man to care for as many as 30,000 layers. Mr. Naraghi's equipment feeds, waters, cleans up after the chickens and collects the eggs by push button.

T. R. Mackay, Fairbanks Morse & Co., traced the development of the submersible pump, and pointed out that there are many applications where submersible pumps are clearly superior to other pumping methods. He concluded that indeed the farmer should think submersible.

The final presentation by Carl Gill, Thompson-Gill Inc., discussed equipment for the automatic handling of feed for cattle, once again pinpointing the necessity for the present-day farmer to let the machine do as much of the job as possible.

Residential

Home Economics

"You don't sell women, they sell themselves," and nothing brings this about faster than good demonstration, Marguerite Fenner, PG and E. said in the opening session Thursday. Cooking schools have made a big contribution, she stated, but are held in halls blocks from the place where sales are made. The dealer's store is the best place to demonstrate appliances, she said, and since utilities and distributors want more sales perhaps the time has come to give a little more and get a little more—not spend more but get more for the money.

To illustrate how potential buyers may be brought into a dealer's store, she introduced Kathleen Brick, Lever Bros., who put on her noontime presentation to working women. The dealer invites these women to bring a sandwich (he'll provide dessert and coffee) and see the new fabrics modeled and laundered. In a showing that is professional, clever and informative, Miss Brick proves that a wash and wear dress is exactly that, gives the women a look at new styles, gets them back to work on time.

There is no need for women to be confused by the various products on the market today, Jessie Cartwright, Norge Sales Corp., Chicago, declared in a talk that combined good sense with humor and left her audience chuckling hours afterward. They are all good. Each homemaker must find her formula and stick to it; study equipment available and purchase to fit her need. And she must learn to control the water she uses for washing; no manufacturer can do it for her, she reminded the group.

Home economists were given a program particularly for them on Friday morning. Beauty through utility in kitchen design was brought out by Janean Schaetzel, San Francisco consultant and designer, who counsels planning carefully, equipping wisely and beautifying naturally—all to suit the needs of the particular family.

It is generally agreed that the drip-dry concept has limited appeal and that the optimum in ease-of-care will come from the proper combination of well constructed and finished fabrics with completely mechanized home laundrying, Mary Ann Morris, University of California Department of Nutrition and Home Economics, told the group in a discussion of "Wash and Wear."

A report on the third annual Live Better Electrically Women's Conference in Chicago prepared by Barbara Swain, Southern California Edison, gave the meat of this conference for those unable to attend.

Newest developments in food research by Robert L. Olson, Western Regional Research Laboratory, USDA, Albany, and California Foods Research Institute, assisted by Helen Rathbun Tobias and Dorothy M. Canet, rounded out this informative program.

Kitchen and Laundry

New products, new features and new selling strategies will be necessary between now and 1965 to maintain appliance spending as customers move along on the life cycle, Bertram J. Lange, *Life* Magazine, concluded from data collected by personal interviews in more than 10,000 households. Taking this down to the West, he said that several factors point to a tremendous potential. Most important probably is population growth—census projections call for increases of 38% in Oregon, 33% in Washington and 57% in California.

The West has gained a march on

In a huddle during residential meeting: Seated—E. W. Meise; Frank Falge; Bertram J. Lange, Life Magazine; L. H. Shaff. Standing—Clark Chamberlain; Dick Riley

the rest of the country because it has suited its selling strategies to exploit the markets for newer appliances, Lange said. The Western area represents 14% of all households but accounted for 27% of all electric blankets and 24% of all expenditures for automatic clothers dryers. Incredibly these 14% of the Western households bought only 14% of the air conditioners, he declared.

Kitchens are dollars these days and for the past two years domestic remodeling has added up to more dollars than new home construction, Will M. Kline Jr., Westinghouse Appliance Division, said in describing the "kitchen revolution." The housewife's imagination has been captured by the built-in idea which, added to color, has brought volume to today's spectacular heights.

There is a tremendous immediate potential in the modernization of kitchens today, Kline stated, and a much greater potential for the electrical industry in the developments that lie ahead. "Your promotion of today's all-electric kitchen and laundry will prepare the way for more advanced kitchens. New developments now in prototype will be available as soon as the market for them has been developed," he said.

Among the things on the drawing boards and in prototype, he said, are appliances designed to move out of the kitchen into living areas. Refrigerated compartments will be conveniently located about the house; ranges will have wheels and will plug in where needed. There will be outlets with clock controls for small appliances. Frozen food for a complete meal will be removed automatically from a freezer to an oven in the proper time sequence by selector button.

Aiming to make 8,000-plus employees Live Better Electrically salesmen, Southern California Edison instituted a new employee purchase plan in January 1955, Vince Martin told the PCEA Kitchen and Laundry Section at its Friday morning session. The plan that the utility instituted makes it possible for an employee to purchase electrical equipment with no down payment, with no interest charges, with pay roll deductions and at a reduction from the list price.

As a result of the plan, Edison currently is handling more than $600,000 in accounts receivable, representing 1,700 contracts in force. Martin stated that, originally, the utility expected to need $300,000 to finance the plan – now it believes that the plan will level off at about $1 million. In the beginning, employees were limited to the load building appliances. Later this was expanded to include all major items and now can be applied to any piece of electrical equipment.

The company has arranged with manufacturers and distributors for special prices for its employees. Whether or not the purchase goes through the retail dealer or is made direct is left at the discretion of the manufacturer or distributor.

In the opening talk at this session, John Lautz, California Electric Power, reported on the success of that utility's survey of the value of quick recovery water heaters. Under Lautz's direction, a study was made to compare "the operating characteristics of the new quick recovery water heater (40-gal tank with two 4.5-kw units which are interlocked—only one unit can come on at one time) with the flat rate water heater which has a single element heating unit located near the bottom of the tank." As a result of the study it was recommended that the utility standardize its water heater sales to the 40-gal, 4.5-kw quick recovery heater, and that an appropriate metered rate be adopted, Lautz said.

When California Electric Power accepted Lautz's recommendations special promotions were instituted to sell company employees, plumbers and appliance dealers on the importance of featuring the quick recovery water heater. The utility arranged demonstrations in each of its market areas. Since the program was put into effect, he said, there has been an increase of 43.3% in the sales of electric water heaters in those areas.

In the discussion period which followed the two talks, Committee Chairman L. H. Shaff, Arizona Public Service, suggested that the committee recommend changing its name from "Kitchen and Laundry Committee" to "Electric Appliance Committee." A unanimous vote from the PCEA members present endorsed this change of name, which will be presented to the governing body of PCEA.

Home Lighting

Sales people must learn how to sell lighting, not fixtures, before residential lighting makes the progress it should, Rose Coakley, Thomas Industries, indicated in a talk on developments in this field. Her color slides gave ample evidence of what can be done in the home with imaginative use of lighting.

A rundown on what the utilities of the West are doing to promote residential lighting, prepared by H. A. Brody, Southern California Edison, proved that this service is rapidly growing out of its stepchild class; is getting its full share of attention from most companies.

Importance of lighting in a utility's load was pointed up by R. L. Sawyier Jr., PG and E, who described a recent experiment in Marin County where lighting in six homes (two each in low, medium and large income classes) was recorded on separate meters. After one year it was found that one-third of all kilowatthours consumed in these homes came from lighting—a load that has had no particular promotion in the past.

What the Academy of Lighting Arts is doing to inform the industry and its allies was brought out by Sawyier and by Robert Haskell, PG and E's magician, who sells and instructs while he entertains. Stating that the average home uses 780 kwh of lighting, the light for living home 2,500 kwh, Haskell told of the tremendous market potential and the number of people and industries that stand to profit if it is sold. Recorded instructions to Haskell (at

the blackboard) brought down the house while they put over his point.

A. C. Grotenhuis, Thomas Industries, explained the CIL (Certified Inspiration Lighting) program of his company in a presentation that was entertaining enough to hold its own, even on the heels of Magician Haskell. In an attempt to get to the homeowner well before the job is let, Moe Light Division offers selling helps for the electrical contractor or utility such as: house wiring plans showing first a basic, then a certified job to use in talking with customers; template for furniture layout; stamp and ink pad for stamping CIL verification on plans; a builder's certificate; advertising mats; color shots (or slides if wanted) of well-lighted rooms. If the electrical contractor does not want to risk loss of a job on price, he can quote a minimum installation, ask the customer to drop into a Moe office and see what is available in a certified house.

A consumer buying survey to show interested parties such as PCEA what is happening in their own backyards was described by George J. Billinger Jr., Sylvania Electrical Products. His company has conducted personal interviews in various marketing areas on both commercial and residential levels to determine where, why, in what quantity and how often people buy light bulbs. Billinger's slides covering residential data in three Pacific Coast areas showed, among other things, that 79% of the people buy lamps at the grocery store and that hardware and electrical dealers are not the factor they once were in this field.

Home Wiring

The woman's point of view on housepower was brought out in a panel including Dr. Gertrude Leuhning, San Francisco State College; Mildred Novotny, U of C Agricultural Extension Service; Carmen Roden, homemaker; Peggy Boyer, ELECTRICAL WEST; Catherine Murphy O'Flynn, San Francisco *Call-Bulletin;* Betty Nicholas, San Jose *Mercury.* Some of the suggestions: Electricity is amply accepted—get it off the householder's conscious level of concern and simply make it a part of a richer living because it doesn't demand conscious concern; housepower has been sold to a dedicated-to-its-use multitude—it is up to the industry to come through on the contract, and it's easier and cheaper to do it by building and installing properly in the beginning; post wiring diagram on new homes; prepare a card making it simple to analyze circuits; keep the women's page editors informed—tell them what you are doing in releases that are easy to read and use.

A survey of homemakers under direction of Dr. Leuhning showed that many women have no knowledge of "housepower." Since the information they lack is readily available in pamphlets prepared nationally and in some cases, locally, much of the Friday discussion centered on getting this material to the proper people. It was suggested that an index of such information might be compiled for use of groups and individuals.

Heating and Cooling

"Did any of you ever see a gas-heated blanket?" asked Pressly H. McCance, Edwin L. Weigand Co., to back up his claim that electric heating can do jobs that just can't be done with any other fuel. He said that because of its safety and uniformity and the fact that it can be measured out in precise amounts, electric process heating has won full acceptance in industry, where it presents a way to adapt automation to this job.

From the utility standpoint, industrial electric heating brings impressive benefits as does electric school heating, he pointed out. This new load is essentially a nighttime and early morning load with a good diversity, he said, and today there are 150 electrically heated schools either in operation or under construction. About half the classrooms needed, 70,000, are being built each year and the average uses 15 to 20,000 kwh annually, he added.

"Not 'Cutback Incandescent'" says A. C. Grotenhuis, Thomas Industries, of CIL plan

Electric heating in the home, the third market, appears to be the utility's greatest load building opportunity to date, he said. Utility executives believe that it is coming, like air conditioning, whether they want it or not; that it may be the only known residential service that can provide winter load building at a sufficiently rapid rate and the only means of piercing through the ceiling in residential load building; that it is a means of protecting themselves against loss of revenue to gas competition.

A working model of a baby bottle warmer-cooler using the thermoelectric principle was brought to the meeting by Walter T. Baker, Western appliance manager for Westinghouse. This device keeps the bottle at 40° until it automatically switches to warming temperature at feeding time.

Slides of other prototypes showed applications of this principle to create heat or cold directly from electricity: a silent, vibrationless refrigerator without compressor, a small dehumidifier for keeping kitchen cabinets or closets moisture free; a wall panel that heats or cools and incorporates electroluminescent lighting.

Home Economics Committee: Seated—Edna Poyner, co-chairman; Evelyn Conant, co-chairman; Marguerite Fenner, PG and E; Dorothy Huse, White King; Standing—Mary Means, San Diego Gas & Electric; Luci LaFontaine, Calgon; Mary Jane Eisenberg, G-E; Lorene Craft, Westinghouse

THIS IS A

New ORANGEBURG® CA* CONDUIT *with Flush Coupling Attached!*

With no separate couplings to handle or attach on the job, Orangeburg CA lays faster, costs less to install. Each long, light length has a *flush* coupling attached at one end and a standard 2° male taper at the other end, making installation a simple, one-step operation. And, since the coupling *is* attached, there are no coupling cartons to warehouse or carry to the job.

What's more, with the coupling *flush* to the conduit's outside wall, new CA is easy to stack, store and handle. The flush coupling also eliminates "staggered" joints in the trench. And that means real savings in cutting and tooling time.

Like the hundreds of millions of feet of Orangeburg fibre conduit in use since 1893, new CA has self-sealing joints and impermeable walls. Its smooth, 100% fibre raceway adds years to cable life.

New Orangeburg CA is available in 2", 3", 4", 4½" and 5" sizes. Orangeburg Standard and Nocrete Conduit, with separate sleeve couplings, are available as always. Write Dept. WE-39 for Catalog 52.

ORANGEBURG MANUFACTURING CO.
Orangeburg, New York · Newark, California
A Division of The Flintkote Company, Manufacturers of America's Broadest Line of Building Products

Orangeburg Fibre Conduit is distributed by Graybar Electric Co. and General Electric Supply Co. with branches and stocks in principal cities.

Stirred by Builder

Homebuilder Alan Brockbank bulldozed away traditional ideas as to the house of today as he would the dead trees and old shacks on a piece of land he had selected for one of his big tracts of homes. If the approximate 100 attending the Intermountain Electrical Assn. annual conference on Lincoln's birthday, celebrating Thomas Edison's, Feb. 12, in Salt Lake City, paid heed, they will take another look at what's happening in homebuilding and get the electrical part of such a movement synchronized with it.

The past president of National Association of Home Builders and still a potent force on its research committees, Brockbank "spanked" the electrical group for being slow in working with builders to make homes electric. The gas people, he warned, are offering all sorts of inducements and improvements to get the business. He cited intensive research in materials and methods to bring house building costs down because "labor is simply eating us up." Among developments he had seen that promised better homes at better prices were "sheet lighting (Panelescent) by Westinghouse, direct thermocouple heating, a complete wiring harness for a house by General Electric. He urged closer cooperation between the industry and home builder professionals and a real effort toward home electric heating.

Dell R. Holbrook of Bountiful, IEA president, and Walter J. Michelsen, new vice-president (General Appliance Co.), had a well-rounded program for the compact one-day annual meeting. The morning was given to preliminaries and ended with an address by E. M. Naughton, president, Utah Power & Light Co. He reviewed what the investor-owned utility industry has done to meet the growing demands for power, compared U. S. power development to that boasted for Russia, discussed government competition and its growth and ended by reminding his hearers of many things the industry was not doing but should be. In a question period following he gave an informal, succinct summary of the nuclear power situation as of today.

Kaufman Miller Hansen Robbins

Under a banner, "This is a good business," four speakers presented as many aspects of the electrical business—contracting, merchandising, home service and legal. Glen L. Miller, W. H. Bintz Co., ran the show, adding a tag to the banner line—"if we make a profit."

Evelyn Hansen, UP&L home service director, told of the profitableness to salesman and retailer of making a home call immediately following every major appliance sale to make sure the customer knows how to use it and is completely satisfied. "Without customer satisfaction there is no enthusiasm, without enthusiasm no endorsement, no back fence selling. Without this force there is no possibility of profitable growth," she said. Expensive service calls, neutralizing the potential sales resistances from word of mouth advertised dissatisfactions, even replacement of equipment at times, can eat up all profit, she reminded them.

W. P. Robbins, Central Electric Co., and until recently District 8 vice-president of National Electrical Contractors Assn., declared the day of the "wire jerker" must give way to a more professionally trained qualified electrical contractor because of the more technical aspects of equipment and the more complex business forms in use, government and union paper work. He then told what NECA is offering its members in training programs, in accounting and estimating and engineering systems, in labor relations, and even in market research and promotion. Surveys have shown that the contractors' market potential is from three to ten times as great as previously visual

Holbrook Stone Michelsen Brown

Isgrig

the public respect for our own advertising," he said.

To tell of the "Electric Living Program" now being sponsored by Edison Electric Institute to carry on from the G-E sponsored "Live Better . . . Electrically" and to coordinate into it the Housepower and Light for Living programs, Les Waggoner, Arizona Public Service Co., came to represent Don Willis, regional chairman. He explained the unified program and announced its special events, the national advertising being done and the methods of capitalizing with local tie-in.

Two sales inspirational speakers concluded the event, Cecil J. Prashaw of Frigidaire, the afternoon session, and Erik Isgrig of Zenith Radio Corp., the banquet. Both re-emphasized the fundamental factors in salesmanship. Prashaw mentioned many fantastic new devices being developed in the laboratories. He felt that the chaotic appliance market situation was settling down and that salesmanship would supplant price and franchises again mean something. Isgrig spoke of the little and emotional factors that make for selling.

Carlos Stone, new president, and the other officers and directors recently elected, were installed at the noon luncheon.

Prashaw

Restyle SRVEA for Action

While such features as Tony Whan's amusing and inspiring luncheon address were more spectacular, the most significant thing about the fourth annual electrical conference of the Snake River Valley Electrical Assn., at Boise, Feb. 14, was its new integrated program with that of Idaho Power Co. Paul Worthen, General Electric Co., retiring president, described it in detail after months of work upon it. The newly elected president, Joe I. Wright, Afton-Lemp Electric Co., and his board pledged to carry it out as the membership voted the necessary by-law changes to authorize it.

What it boils down to is that both the sales programs of the association, formerly run separately, and those of Idaho Power, will be unified. Previously the SRVEA held its yearly conference, offered its members group insurance, held a summer picnic and sponsored the home shows, last year in four cities. Under the new plan, Worthen explained, the advertising and promotion activities of the utility and association will coordinate on retail appliance drives, wiring and lighting activity, service shop development and the electrical living programs.

Appropriate support to this idea came from D. J. McGonigle, general sales manager, Montana Power Co., who told of the success of a unified

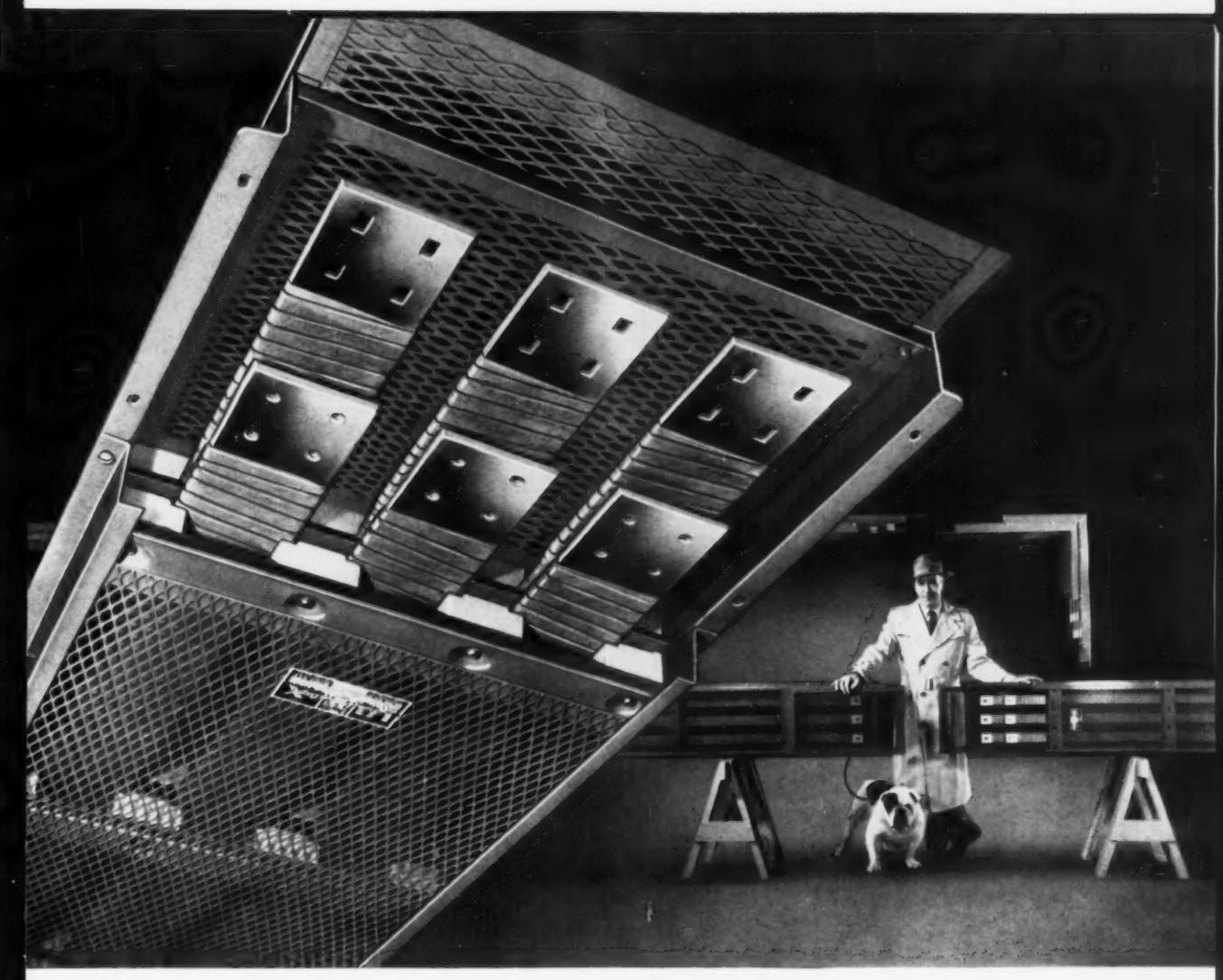
Worthen

Wright

ized. Hence to realize this potential, he said, contractors must qualify themselves to give the public and industry the services they will need.

Mike Kauffman, manager of the Sears Roebuck store, after quoting the UP&L 1958 dealer sales reports of appliances and growth figures for the area, urged two things—"Trade up and train up." The cost of selling inventory at no profit is just as great or greater than selling at a profit. "We must have the courage to suggest the best we have and tell our customers why it is better than the advertised model," he said. Of training he said that salespeople should be taught that selling is fun as well as remunerative, that the real rewards in life come from the thrill of achievement. "A hole in one on the golf course isn't half as thrilling as selling $3,000 worth of appliances."

George Nelson, attorney for the IEA, explained what the "crackdown" on false and misleading advertising announced by the Federal Trade Commission meant. But he cautioned not to place all reliance on these rules to correct abuses in selling. "If we pay more attention to our own business reputation for integrity and honesty it will bring



"PAIRED PHASING" HELPS YOU MEET THE LOAD . . . WITH POWER TO SPARE

Lo-X Bus Duct assures lower balanced voltage drop . . . extra current carrying capacity

Increase your safety margin against unexpected power fluctuations! BullDog BUStribution®—using a paired phased arrangement of aluminum bus bars—neutralizes magnetic fields, assures uniform balanced current distribution and low voltage drop. Exclusive "paired phasing" acts to distribute current equally throughout the cross-sectional area of each conductor . . . balances current among all conductors . . . reduces impedance to a minimum. Full use of the conductor material assures extra capacity, allowing the LO-X feeder system to operate at top efficiency.

And LO-X offers these additional operating advantages. The duct has no moving parts . . . thus nothing to wear. It is prefabricated . . . adapts to any building contour. Exclusive scarf-lap joints assure rigid connections . . . speedy installation. BullDog's five-step silvering process of aluminum bus bars guarantees maximum conductivity at connection points. Special spring-type cup washers at the joints give a positive *bolted* connection.

For a distribution system that guarantees top performance and long, continuous service settle on *Bus Duct by BullDog* . . . it will readily adapt to your client's changing power needs.

BULLDOG ELECTRIC PRODUCTS DIVISION
I-T-E CIRCUIT BREAKER COMPANY
BOX 177 • DETROIT 32, MICHIGAN

In Canada: 80 Clayson Rd., Toronto 15, Ont. Export Division: 13 East 40th St., New York 16, N.Y.

Consult the following Pacific Coast representatives:

Coast Electric & Manufacturing Co.
1733 N. E. Seventh Ave., P. O. Box 7712
Portland 12, Oregon

Young Electric & Mfg. Co.
2134 Curtis St.
Denver 2, Colorado

Safety Switchboard Company
910-89th Avenue
Oakland 21, California

BullDog Elec. Prod. Co. of Los Angeles
2885 E. Washington Blvd.
Los Angeles 23, California

McGonigle

Koch

Whan

advertising activity. Selecting a day that had little competition, getting everyone to advertise something electrical that day, McGonigle said, gave the unified industry complete domination of the paper and the market that day. Several of these "Electrical Tuesdays" proved highly successful in Montana towns and will be repeated this year. For those wishing to select another day it has been renamed "Electroday." And there will be 12 such days in 1959, he said, one each month.

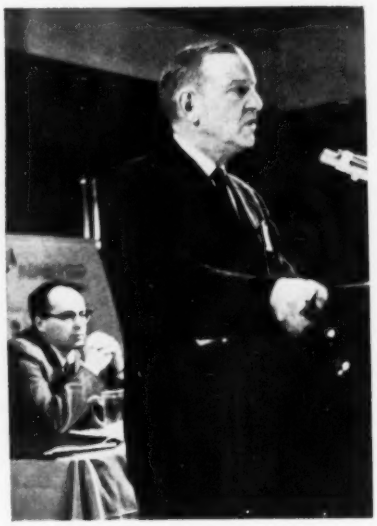
While dealers in Idaho had sold $24 million worth of appliances last year, Al S. Gilbert, general sales manager, Idaho Power Co. and conference program chairman, declared, it will take some such all-out, unified total industry action to continue selling at such a pace.

To set the keynote for the program H. Ferd Koch, owner of Electric Service Co. and subsidiaries in electrical contracting and appliance merchandising, former SREA president, a city councilman and state contractor board chairman, as well as NECA chapter president, was called to tell "Why we are here." With quiet earnestness and humor he did so, summarizing it as follows:

"To know your product, electricity, to know that it is the best. To continue building a business climate of soundness and responsibility, it breeds confidence. To advertise, keep the bell ringing. To service what you sell, it pays. To train those who must succeed you, train them well, keep the match burning, light the way for the mechanic or salesman of tomorrow. Get to know one another better, the best way to overcome an enemy is to make him your friend."

The big noon luncheon, augmented by the Boise Ad Club and business men to a 280 total attendance, was entertained and inspired by Tony Whan, showman and sales speaker, Pacific Outdoor Advertising Co., Los Angeles. Maintaining that selling has made the American economy what it is in comparison to that of the world, he combined good selling advice with appreciation of the American competitive system.

Turning to the EEI and the industry at large, the Live Better . . . Electrically program was told by W. H. Mott, General Electric Co., Salt Lake City. He described the opportunities ahead in the electrical market, pointed to the strong competition now threatened by the gas industry, and told of the national ad programs timed for the year's best buying seasons. Gilbert followed to reassure that LBE is not dead but,



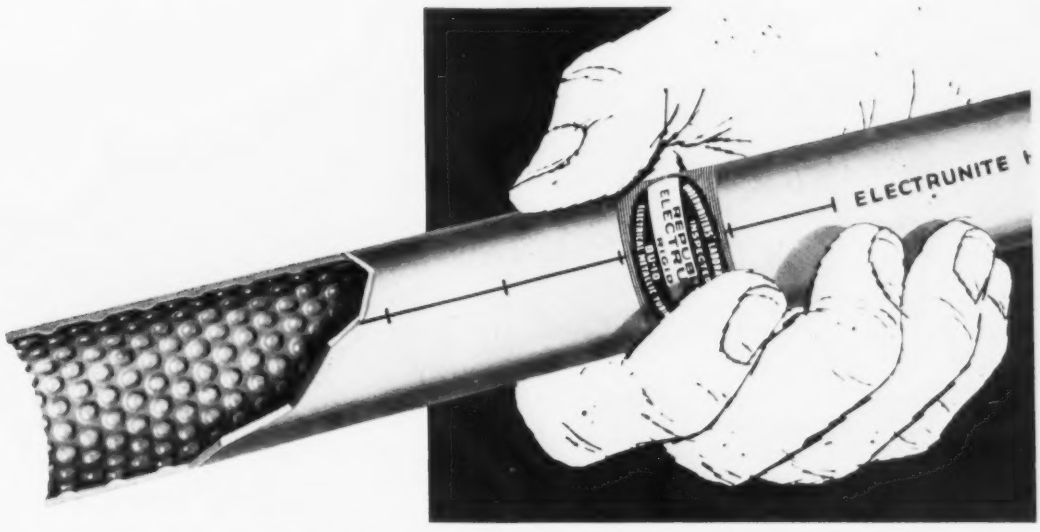
Bruce Wright

that under EEI sponsorship and utility and industry participation at the local level, will be stronger than ever.

Two exceptional movies were shown. The first was the new Westinghouse "Total Electric Home" movie depicting a not too far distant super electric home. The other was a new movie on positive thinking by Dr. Norman Vincent Peale, which the Idaho Power Co. is making available for showing to business, employee or social groups.

An annual business meeting concluded the one-day session, followed by an installation dinner and dance that evening. Elected to office for 1959 were: J. I. Wright, Afton-Lemp Electric Co., president; Ward Hall, Pocatello Electric Supply, vice-president; James Bruce, Idaho Power Co., secretary; Carl Young, contractor, treasurer; Paul Worthen, G-E Co., immediate past president; Pete Furno, manager. New directors: Rod Frost, Boise Radio & TV; Lysle Keith, The Lighthouse; G. E. Arnold, Electric Appliance Repair Co.; Henry Falkner, Westinghouse Electric Supply; H. Ferd Koch, Electric Service Co.; J. R. McDonald, Line Material Co.; and Al Gilbert, Idaho Power Co.

Holdover directors include: W. R. Reed, Idaho Power; H. W. Christensen, G-E Co.; Maynard Smith, Graybar; Herbert Heatherington, contractor; Dwight Zundel, radio & appliance; Byrle Carr, Risen-Cain Appliance. Chapter presidents are: Morris Saville, G-E Supply, central chapter; Reed Goold, Magic Valley chapter; and Ward Hall, Eastern chapter.



Republic ELECTRUNITE E.M.T. with SILVERSLICK
makes wire pulling 37% EASIER...wire pushing easier, too

NOW...THE BEST COSTS EVEN LESS INSTALLED

SILVERSLICK is quick! New, improved Republic ELECTRUNITE® E.M.T. with SILVERSLICK inside finish makes wire pulling up to 37% easier. Wire pushing is even easier.

SILVERSLICK—the SILVER-colored, SLICK inside finish developed by Republic—combines with ELECTRUNITE's exclusive "INSIDE-KNURLING" to offer you greater installation advantages and economies.

SILVERSLICK helps wires slip smoothly, easily through the tube and roll over the knurling. Because contact surface and friction are reduced, wire pulling, wire pushing are easier.

In the laboratory, in the field, on the job . . . you've never had it so slick!

ELECTRUNITE works slick in concrete installations, too. ELECTRUNITE's tightly adhering galvanized coating protects against corrosion. It won't chip, or flake off during bending. No threading is required. Uniform concentricity assures snug fit of couplings and connectors—shutting out moisture and concrete.

Republic ELECTRUNITE E.M.T. offers complete wiring protection. It is approved in the National Electrical Code, is produced to A.S.A. Specification C80.3, and Federal Specification WW-T-806, latest revisions. ELECTRUNITE E.M.T. carries the Underwriters' Laboratories Seal of Inspection.

To learn more about the installation advantages and economies of Republic ELECTRUNITE E.M.T., call your electrical distributor. Or, send coupon today.

Try this DEMONSTRATION . . .

Take a sample length of Republic ELECTRUNITE E.M.T. with new SILVERSLICK inside finish. Insert a bundle of 25 pipe cleaners. Now, push-pull the pipe cleaners through the tubing.

Depending on the type of wire coating as many as three Number 12's can easily be pushed through a 20-foot run of ½" Republic ELECTRUNITE E.M.T. with four right-angle bends. Ask your electrical distributor sales representative to show you samples with this new inside finish.

REPUBLIC STEEL
STEEL AND TUBES DIVISION

REPUBLIC STEEL

Cleveland 8, Ohio

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION
DEPT. C-6889-A
216 EAST 131st STREET • CLEVELAND 8, OHIO

Please send additional information on the following:
☐ Republic ELECTRUNITE E.M.T. with SILVERSLICK Finish
☐ Republic Bending System

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State_____

New-home buyer: This...

not this... PRICE

MEDALLION HOME
LIVE BETTER ELECTRICALLY

is your guide to ***Luxury Electric Living***

It's a startling fact: Two out of three homes being built —in all price ranges—are already *electrically obsolete.*

But there is one guarantee that a new home will offer the convenience of modern electric living—that it will *stay* up-to-date electrically. That guarantee is the Medallion Home Award.

Before you buy, always look for the Medallion emblem, awarded only to *extra-value* homes (and apartments) which meet *all these standards* of the nation-wide Medallion Home program for better housing:

Major appliances, including an all-electric kitchen, already installed *and included in the purchase price.*

Proper lighting provided for in work, play and traffic areas—illumination for beauty as well as for your family's safety and comfort.

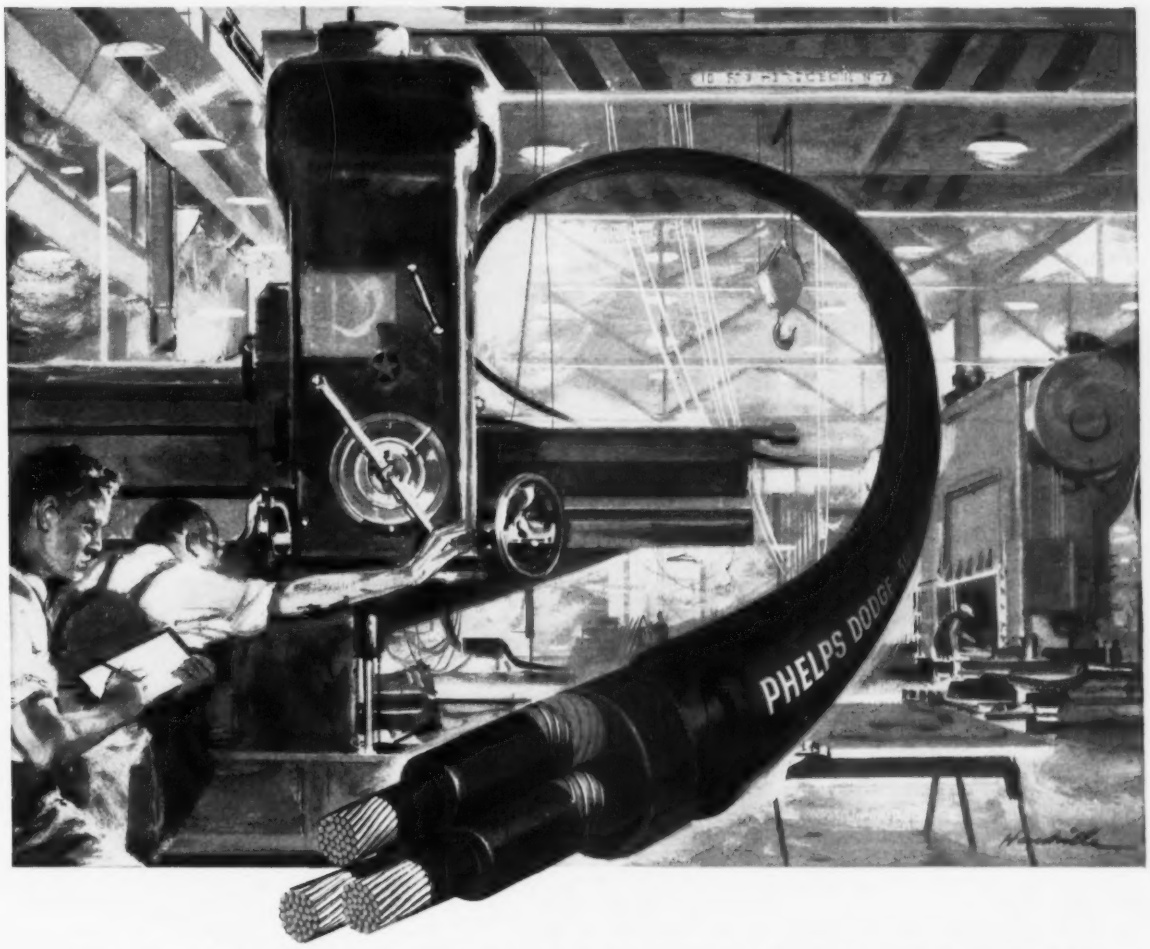
Full Housepower wiring—ample for all your present appliances *and* the many you will want tomorrow.

High resale value, because Medallion Homes *stay modern.*

When you are shopping for a new home, ask first of all, "Is it a Medallion Home?"

SOUTHERN CALIFORNIA Edison COMPANY *helps you* LIVE BETTER—ELECTRICALLY

Steady plant production demands dependable power cable . . .



HABIRITE-HABIRPRENE CABLE gives unexcelled performance!

To help assure uninterrupted production, modern industrial plants require reliable cables for delivering electric power to production lines. The service reliability of Phelps Dodge *Habirite-Habirprene* is unsurpassed by any other rubber insulated neoprene jacketed type RR cable.

Habirite-Habirprene is a combination of specially engineered butyl rubber insulation and neoprene jacket. The overall features of this cable provide greater resistance to heat, oxidation and ozone; improved electrical properties, including superior insulation resistance; higher copper operating temperature; superior flexibility; improved mechanical toughness against damage from installation hazards and extra resistance to corona, an absolute necessity for high-voltage neoprene jacketed cable.

As a general purpose cable, *Habirite-Habirprene* assures the utmost in safety, durability and reliability.

See Your Phelps Dodge Distributor!

PHELPS DODGE COPPER PRODUCTS CORPORATION

SALES OFFICES: Atlanta, Birmingham, Ala., Cambridge, Mass., Charlotte, Chicago, Cincinnati, Cleveland, Dallas, Dayton, Denver, Detroit, Fort Wayne, Greensboro, N.C., Houston, Indianapolis, Jacksonville, Kansas City, Mo., Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Pittsburgh, Portland, Ore., Richmond, Rochester, N.Y., San Francisco, St. Louis, Seattle, Washington, D.C.

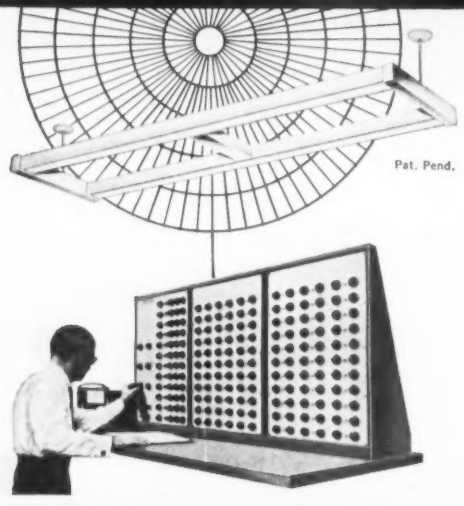
Virtue BROTHERS OF CALIFORNIA

world's largest manufacturer of metal dining furniture, chooses Smoot-Holman lighting fixtures for true scientific lighting!

Robert Kjer Jakobsen, in conference in Virtue Bros. new product development department. Smoot-Holman scientifically designed lighting fixtures are used throughout departments of this huge plant.

scientifically designed **SMOOT-HOLMAN** lighting brings you

"TOMORROW'S LIGHTING TODAY"



Smoot-Holman's advance design analogue computer. Used to achieve superior lighting design and unsurpassed lighting performance!

Robert Kjer Jakobsen, Chief Designer at Virtue Bros. Mfg. Co., has this to say about SMOOT-HOLMAN Lighting: "We're using Smoot-Holman Perfect Vision Luminaires in many areas in our office and plant because we feel they provide excellent light with no glare or sharp shadows. Before deciding on Smoot-Holman lighting fixtures we made a survey of a number of lighting installations and came to the conclusion that the Perfect Vision unit was the ideal one from many angles.

"In making our decision we took into consideration a number of things. Of first importance was to get a good lighting job ... which the Perfect Vision Luminaires give. Other important advantages we found in the Perfect Vision Fixture were ease of installation and maintenance. With maintenance labor costs what they are, we have to consider not only the initial cost of fixtures but maintenance as well. We have found that the Smoot-Holman Perfect Vision Fixture meets all our requirements perfectly."

SMOOT-HOLMAN CO.

Inglewood, California

TOMORROW'S LIGHTING TODAY

LR LRL LL T E C LB SLB

Red DOT

A TRADEMARK TO REMEMBER

CORNER ELBOWS CE

COVERS CV

The enthusiastic acceptance of Red ● Dot Conduit Bodies has been overwhelming. Our thanks to the ever growing number of distributors

Available in a wide selection of styles
Sizes up to 4" Series "A"
Sizes up to 2" Series "B"

Available in the following series:

Series "A" Conduit Bodies
Threaded for heavy wall rigid conduit.

Series "B" Conduit Bodies
Set-Screw for thin wall conduit (EMT) electrical metallic tubing.

All Series take standard covers. RED ● DOT cast aluminum covers are available for all styles.

Send for New illustrated Catalog of complete RED ● DOT Line.

Sold only through Authorized Electrical Distributors

SERVING INDUSTRY Mason FOR 25 YEARS

L. E. Mason Co. BOSTON 36, MASSACHUSETTS

news

Model shows that Etzon, newly developed fluorescent lighting, is really flexible in showing before California Men's Apparel Club, sponsored by Pacific Gas and Electric Co. in San Francisco

Colorado's oldest turbine generator, placed in service at Denver in 1906, has been set up outside Public Service of Colorado's Cherokee station, state's newest, as a memorial to electrical industry pioneers

Seattle Mayor Gordon S. Clinton unveils a giant mosaic mural at the entrance of City Light's remodeled building. First of its type to be installed in a Pacific Northwest office building, the full mural depicts the harnessing of the elements of nature to produce electricity for the benefit of mankind. The 300,000-piece mosaic is more than 32x8 ft

This 60-mph monorail train, by Lockhead, may "fly" passengers to Seattle's proposed Century 21 Exposition in 1961

Robert Paxton, G-E president, and C. C. Walker, Western vice-president, receive '59 Achievement Award from Los Angeles Chamber of Commerce in behalf of G-E Western division staff

Management

Heavy Power Bill Calendar

Legislators did not take long to get bills affecting public utilities in the hopper. In California a proposed constitutional amendment was introduced into the legislature that would give the California Public Utilities Commission authority to regulate the rates of publicly owned utilities. Also introduced was a bill to clear the way for collective bargaining between public utilities and unions representing workers. This measure would set up an arbitration procedure in the event of unsettled disputes.

Another bill has been introduced to permit local taxation of government-owned gas and electric utilities. . . . Conversely, in Wyoming a bill has been introduced to exempt all municipally owned property, including electrical plants, from state property taxation. Twelve Wyoming communities recently lost a court case which, in effect, stated that facilities used for proprietary purposes were subject to taxation.

In Washington two bills were proposed, one establishing two classes of public utility districts. Class 1 would be districts with $10 million or more of net plant value. These would be required to have a five-, rather than three-, manned board. Class 2 PUDs would be all others and could operate with three-manned boards. The second bill would permit county prosecutors to call on the state attorney-general's office for assistance in investigating PUD operations . . . In Oregon a bill has been introduced into the legislature to permit Oregon PUDs to issue and sell revenue bonds without a vote of the people as now required by the state law.

► Tucson Gas, Electric Light & Power Co. had an increase in total operating revenues of nearly $2 million in 1958 over 1957. Earnings per share on the total number of shares outstanding at the end of the year equaled $2.045.

A television interview format was followed in presenting Southern California Edison's series of annual management conferences, held Feb. 2-6 in Los Angeles and Feb. 10 in Visalia. CBS Commentator Bill Stout (center) moderated a panel of Edison executives on the "Outlook for 1959" as one phase of the program. Left to right are Edison vice-presidents W. L. Chadwick, E. R. Peterson and T. M. McDaniel Jr., and general manager of operations W. E. Montgomery

Management Meetings Dramatized

Southern California Edison Co.'s annual management meeting took the form of a Hollywood production this year. Instead of the conventional addresses to the management and supervisory group, Edison staged a TV "interview-type" of presentation presided over by a well-known CBS commentator. The presentation was put on for five successive afternoons, each having an audience of approximately 400 management and supervisory people from the headquarters office and surrounding districts.

Through the use of pertinent questions and answers between the commentator and various executives, the audience was given an entertaining and informative grasp of company policy and problems. In addition, a cleverly staged "commercial" between interviews took the audience back to how TV commercials might have been written about appliances in the early years of the century.

Highly complimentary remarks were accorded this innovation in company communications—in fact, the audience was practically unanimous in praise. Following the presentation each group of company executives attended a dinner at which Southern California Edison's new president, J. K. Horton, was presented by Board Chairman Harold Quinton.

► Washington Water Power Co. reported a 1958 net income of $6,210,497 on operating revenues of $30,246,683. This compares with earnings of $5,704,734 on operating revenues and $27,810,914 in 1957.

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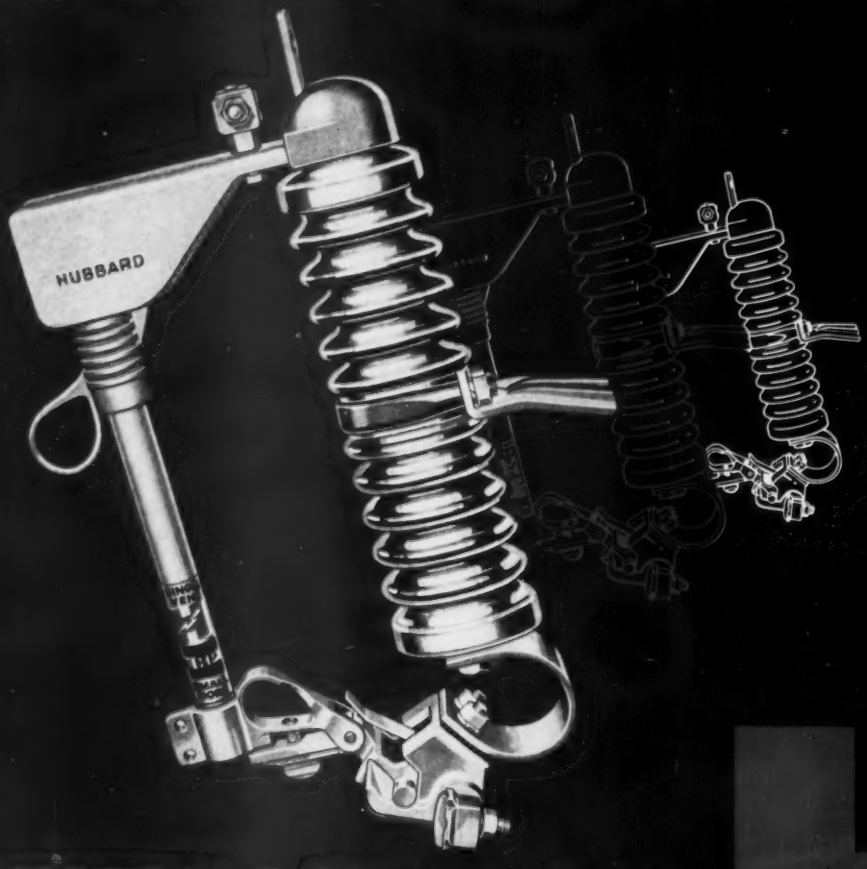
why buy three?



WHEN 1 WILL DO

THE HUBBARD

E H D

Look for this emblem. It is symbolic of the Hubbard EHD, the industry's first Single-Vent, Small-Bore Extra Heavy Duty Cutout—a single cutout that will provide positive and safe protection against all fault currents from the point of minimum fuse melting to the maximum rating of the EHD.

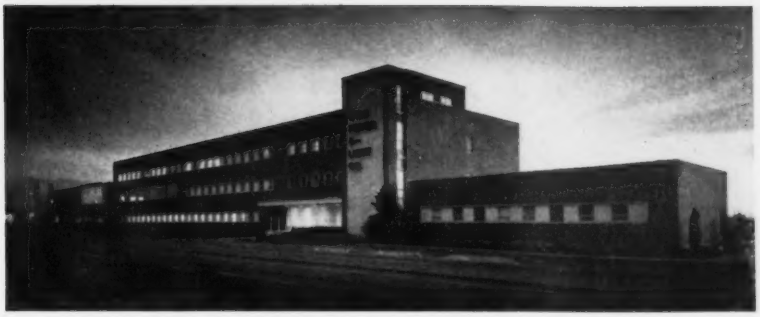
SINGLE VENT H EHD SMALL BORE

ONE CUTOUT, the Hubbard EHD Faultmaster, will fill the requirements of Standard, Heavy, and Extra Heavy Duty ratings. Buy ONE! Stock ONE! Inventory ONE! Plan for ONLY ONE!

Providing three capacities with one size means lower cost handling, warehousing, engineering and installation—and with the Hubbard EHD, you still get full range protection from minor overloads through the maximum EHD rating. All this—plus the increased safety of Single-Vent, Small-Bore operation. **Why buy three when one will do?**

HUBBARD

AND COMPANY • 200 SOUTH MICHIGAN AVENUE • CHICAGO 4, ILLINOIS



Utah Power & Light Co. moved into its new $1,800,000 general office building late in December. Located in west Salt Lake City, 1407 W. North Temple St., the new structure is tied physically and architecturally with the former operations center building, which has 35,000 sq ft of floor space. The building houses an administrative population of 375 including engineering, operations, budget, accounting, legal advertising and publicity, industrial and employee relations, rate and other administrative departments. Functional in design, it has a multiple heat pump installation; employee parking; and a cafeteria

Electrical Week Highlight

A selected group of northern California science teachers and more than 100 talented science students from San Francisco's public schools were given tours of the Vallecitos Atomic Laboratory as a feature of National Electrical Week. The two tours, one for students and one for teachers, were sponsored by the Northern California Electrical Bureau and the Pacific Gas and Electric Co. and served to focus attention not only on Electrical Week but on the broad horizons of modern science. Both groups were shown the General Electric Co.'s atomic laboratory and the PG and E atomic generating plant which holds AEC license No. 1.

► Arizona's senate appropriations committee has "zeroed-in" on the Arizona Power Authority, indicating that APA may have too free a rein with its financial matters. The authority does a $5 million annual business distributing Colorado River power to rural cooperatives, electric power districts and other agencies within the state. Although it is a self-supporting, nonprofit agency, its director is the highest paid of all state officials with a salary of $20,000 a year compared to $18,500 for the governor. The legislature is inquiring why APA should not get approval of its multimillion-dollar budget the same as any other state agency.

► Montana Power Co. is renovating its Butte headquarters office in a manner that is expected to add significantly to the beauty of the business section. The company occupies two three-story buildings, both of which will be unified by modern new fronts. Interiors will undergo a series of changes that will enable the use of additional personnel and business machines, give the city a modern auditorium which can be used for public gatherings as well as company affairs, and beautiful new office facilities for the Butte Division.

Executive Changes

John T. Kimball, vice-president and general manager of Idaho Power Co. and immediate past president of Northwest Electric Light & Power Assn., is leaving the West to become executive vice-president of American & Foreign Power Co. and assistant to its president, Henry B. Sargent. Kimball came to Idaho Power from Arizona Public Service Co. in 1954 and previously has held executive positions with Mississippi Power & Light Co.

The Ohio Brass Co. of Mansfield, Ohio, announced the election of four vice-presidents.

Ott

Louis J. Ott has been elected vice-president and will continue as general sales manager of the company. J. T. Lusignan becomes vice-president and continues to head all O-B engineering activities. Estes C. Thompson, the general factory manager has been raised to vice-president and J. Howard Holan, founder of the Holan Corp. which was recently acquired by O-B, becomes a vice-president of that company as well as president and treasurer of the Holan Corp. Holan manufactures truck-mounted power equipment and utility bodies.

Lloyd E. Cooper, has been advanced to the position of vice-president and chief engineer of the California-Pacific Utilities Co.

Officers of Benjamin Electric Mfg. Co., its newly acquired subsidiary, were announced by Thomas Industries. Frederick Keller, Thomas Industries president, becomes Benjamin president. John G. Beam is executive vice-president for both; George A. Hamm, vice-president, and Arthur E. Swedenborg, vice-president in charge of sales, for Benjamin.

James R. Kearney Corp. has named two new vice-presidents: James R. Kearney, III, vice-president and assistant to the president; F. J. Merrill Jr., vice-president in charge of marketing.

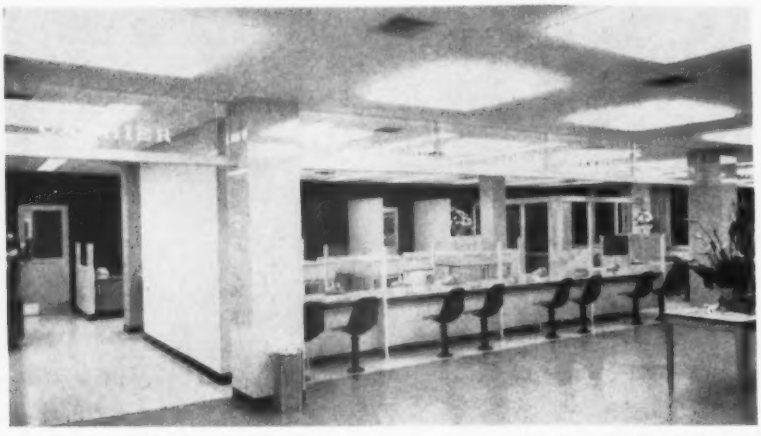
Merrill

Robert Hutchinson has rejoined the Federal Pacific Electric Co. as assistant to Regional Manager Leonard Shelley. "Hutch" will operate out of the San Francisco office of the company.

Customer Builder

Six of these self-service customer pay stations have been installed in banks and commercial establishments by the Grays Harbor County PUD. To pay his bill, the customer takes an envelope from the rack on the left, uses the pen on the right to fill in his name and address, encloses cash or check and drops the sealed envelope into the collection slot. Directions are given on the plaque next to the envelope rack. Merchants consider the stations to be excellent traffic-stoppers and, despite the fact they collect no fee, have deluged the PUD with applications, Manager Jack Stein says.

Market Development



Customers can sit down when they do business with Snohomish County PUD in its new administration building at Everett, Wash. The new center contains 35,000 sq ft of floor space and was built at a cost of $19 per sq ft. It includes offices, a 200-seat auditorium with facilities for cooking demonstrations, space for an employee cafeteria. On-site parking has been provided for 80 automobiles. Eventually two additional floors will be added to the three stories. Heat and air conditioning are controlled from central panel

Carload Club

To promote volume purchases during March when appliance dealer inventories are traditionally low, Hotpoint is organizing a major promotion in the Los Angeles area.

Feature will be a train of upward of 100 cars, all of which will be carrying Hotpoint merchandise from the factory in Chicago to Apple Valley, Calif. Dealers who purchase in lots of at least one carload will gain membership in a "Carload Club" and will be taken to Apple Valley to meet the Hotpoint Special; attend a barbecue reception, then ride the train into Los Angeles.

► A free **lecture program on advances in TV** is offered service associations, trade and vocational schools by Westinghouse. Included are technical discussions on printed circuitry, transformerless power supplies, receiver descriptions, special circuitry and automatic fine tuning.

► Dates for the Western **Summer Market in San Francisco** have been advanced to June 22-26 coinciding with the second week of the Chicago Market. According to Henry Adams, general manager of the Western Merchandise Mart, the change will prevent conflict with the **Los Angeles Market** dates, June 28-July 3, and minimize the effect of the July 4 week-end on the event.

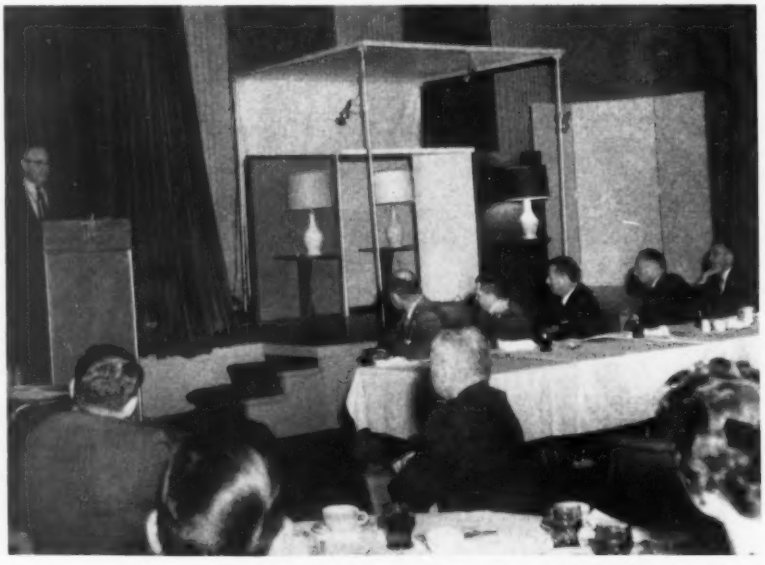
► Anderson Electric Corp. is showing its connector line at invitational meetings throughout the West. Headed by **Hugh James** of San Francisco, Western regional sales manager, and with **Cliff Ortmeyer** from the factory aboard, the traveling display is visiting key cities in California, Nevada, Arizona and Colorado during February and March. Local distributors are handling arrangements.

► The National Stereophonic Radio Committee of the Electronic Industries Assn. has been formed to **study methods of broadcasting stereo sound** by AM, FM and TV.

► Reversing a lower court ruling, the **Supreme Court of Hawaii** has upheld constitutionality of the Fair Trade Act.

► Sixty of the 100 women from all over the U. S. attending McCall's second annual **Congress of Better Living** in Washington, D. C., said they would like their next homes built with air conditioning. Most of them preferred central air conditioning to room units. Two-thirds of the delegates think now is a good time to make a large purchase such as a major appliance.

► Wanting a fresh approach for its annual cooking school, **Arizona Public Service** Co. decided to create *Reddy's Theatre for Modern Homemakers*, a five-act drama produced by the Residential Sales Stock Co. Print-



E. W. Commery, an expert on home lighting and former head of G-E's residential lighting department, told how to choose lamps for comfort, utility and beauty at an industry luncheon during the Winter Market in San Francisco. A large group of invited guests turned out for this fine presentation, sponsored by Northern California Electrical Bureau and PG and E, with the San Francisco Merchandise Mart and the Northern California Chapter of the National Home Fashions League. At extreme right are two of the hosts, O. R. Doerr, vice-president of PG and E, and Henry Adams, Mart manager. Others at head table are Ralph Brown, Retail Furniture Dealers Assn., Bernard Roberts, representing the Lamp and Shade Institute, Herbert Rosenthal, Lamp Journal

Tube mill operator here keeps close watch as he adjusts weld heat on control console.

Contractors find:

CIRTUBE* EMT maintains uniform high quality

KNOWING that the EMT you use is always of the same high quality—from tube to tube, bundle to bundle, and month to month—is one sure way to help guarantee better electrical jobs at lower installation costs.

CIRTUBE EMT is like that. Made in a brand new plant, with ultra modern equipment, the latest techniques, and the most stringent quality control measures that experienced engineers can devise, CIRTUBE EMT has already acquired a reputation for unsurpassed uniform quality and workability.

Uniform, high quality is only one of many reasons why CIRTUBE EMT helps get better, more profitable wiring jobs.

Why don't *you* try CIRTUBE EMT on your next job — you'll like working with it. Now at your Circle wholesaler's.

*Trade Mark

CIRCLE WIRE & CABLE
a subsidiary of
CERRO DE PASCO CORPORATION

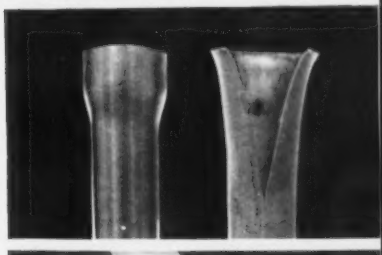
PLANTS: Maspeth and Hicksville, N. Y. **SALES OFFICES & WAREHOUSES:** In all principal cities

RUBBER COVERED WIRES & CABLES • VARNISHED CAMBRIC CABLES • PLASTIC INSULATED CABLES
NEOPRENE SHEATHED CABLES • "CIRTUBE" EMT

CIRTUBE EMT *Ask for it!*

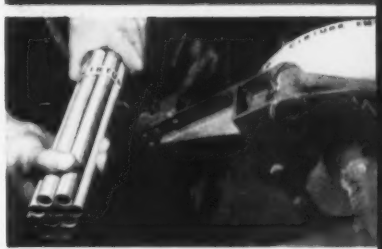
Proper steel plus! The best cold rolled steel plus the right handling give CIRTUBE EMT its natural bendability.

Split-free, bead-free! Induction welded CIRTUBE EMT, left, proves stronger than ordinary EMT, provides easier fishing.



Easy fishing! A baked-on protective coating gives CIRTUBE EMT a built in lubrication for easier wire pulling.

Lifetime exterior finish! Hard galvanized finish for durability; polished satin lustre for lasting good looks.



Tight, easily handled bundles! Bright, orange tapes hold CIRTUBE EMT securely for easy handling on and off the job.

Fast, friendly service! Well-known Circle service through a nation-wide network of well stocked nearby warehouses.

When you consider expansion... the most important investment you can make is in the creative ability of men.

FLUOR

Engineers and Constructors

Design in three dimensions

At Fluor's Los Angeles headquarters, there is an 8,000-square-foot building where 30 plant designers work with 20 professional modelmakers. Drafting tables are within 10 feet of model assembly tables. Another building contains an elaborate photographic studio where precisely scaled isometric and plan views can be taken under shadowless lighting.

All this began seven years ago when Fluor engineers built a scale model and rigged miniature hoists to solve a difficult erection problem. Success of this trial led to experiments with the use of models as a basic design tool. Cost studies showed substantial savings in drafting man-hours (net savings, above modelmaking costs.)

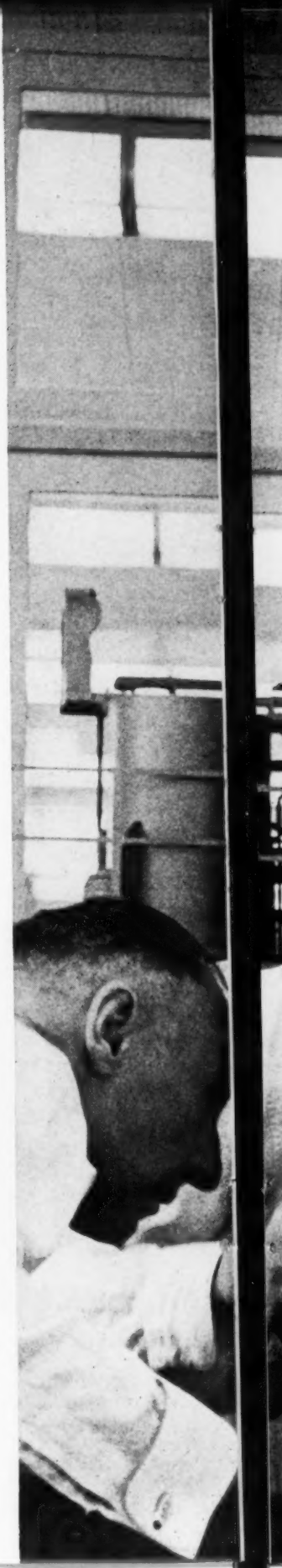
Today, models are to be found in most of Fluor's drafting rooms, and nearly all Fluor-built plants are designed with the aid of this tool. Beyond the dollar savings there are many less tangible benefits. Sizable groups can confer over a model, reach quick agreement on layouts, approve or revise many details at a single session.

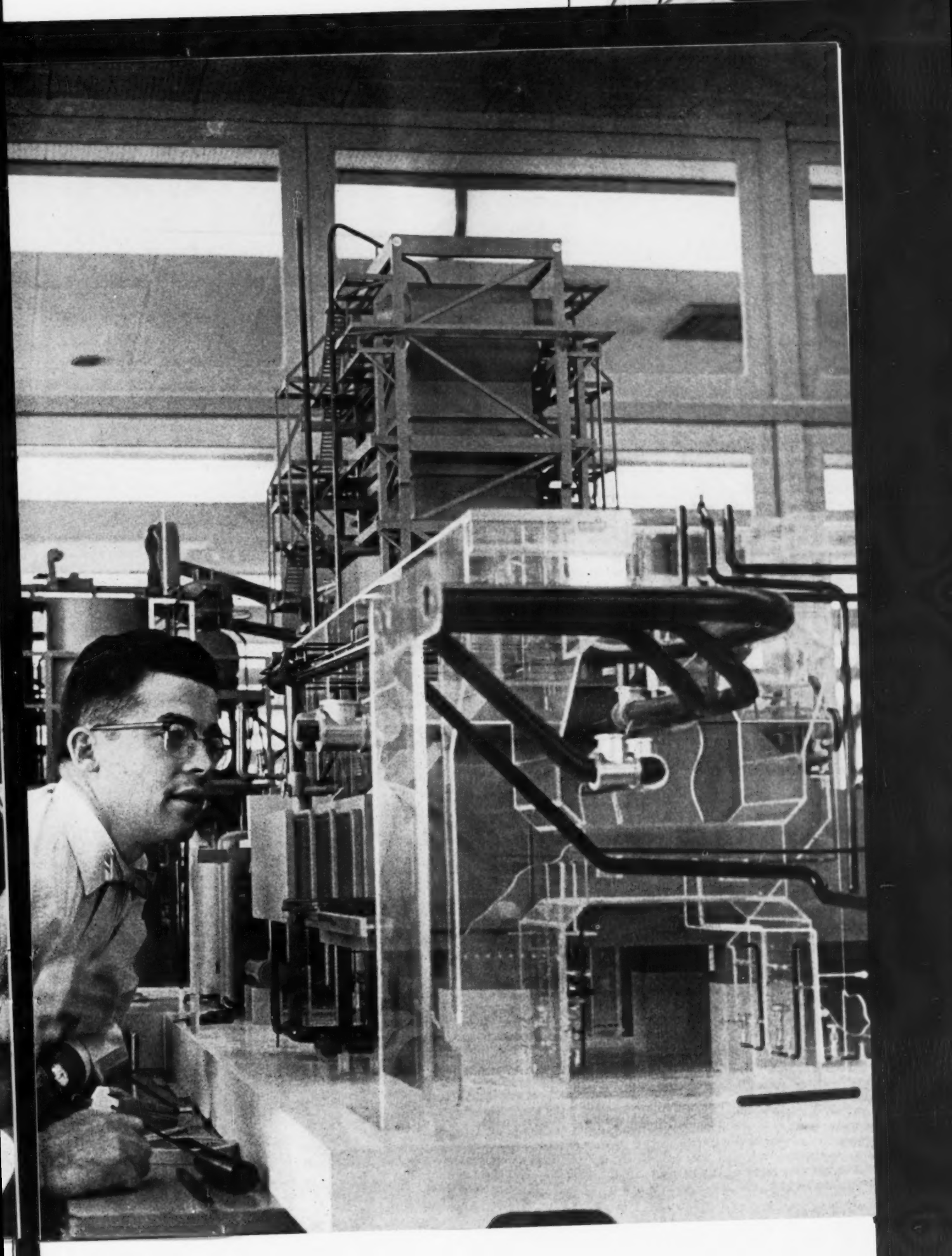
Piping runs are shorter and more direct, valves and instruments are more accessible when designers lay them out on a model (a Fluor comparison study of a refinery design showed a $50,000 saving in pipe, fittings and fabrication by use of a model vs. conventional layout drawings.)

Costly revisions are minimized when many specialists can study a complete plant in miniature before construction begins. In the field, models serve as a reference for construction crews and a guide for operator training.

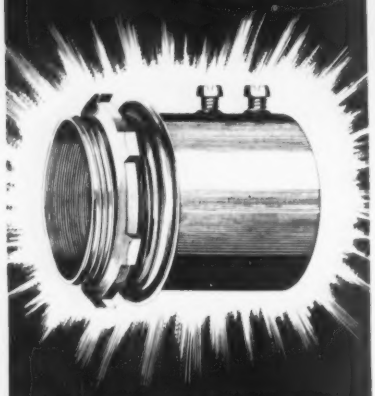
Unless scale models are properly used—as a basic, integrated design tool—most of these advantages are lost. The development and refinement by Fluor of design techniques using scale models has been a creative contribution to the engineering and construction industry.

For more information on the use of scale models in design and construction, write to Dept. 63, The Fluor Corporation, Ltd., 2500 South Atlantic Boulevard, Los Angeles 22, California.





NOW...all ETP fittings are Chromate Plated FOR LASTING PERMANENCE!



...AT NO INCREASE IN PRICE!

Concrete tight! Every size connector and coupling up to 2". Why settle for ordinary fittings when ETP gives you all this:

- New sparkling Zinc Chromate overplating for lasting permanence. Salt spray tested to retard corrosion.
- Exclusive pre-set, deep-slotted STAKED screws. No backing out for conduit.
- Concrete tight with heaviest gauge wall thickness. U.L. file card E24788.
- Precision bevelled edges with extra heavy duty locknut.
- One piece solid tubular steel—cannot open or spread. Sized for uniformity.
- Available in ½", ¾", 1", 1¼" (one screw type) and 1½" and 2" (two screw type)

CONNECT WITH ETP FOR ECONOMY

WEST COAST REPRESENTATIVES:
WEINGART & LUSTIG
1567 E. 25th Street Los Angeles 11, Calif
ADams 3-4111

ETP

ELECTRIC TUBE PRODUCTS
74-16 Grand Avenue, Maspeth (N.Y.C.), N. Y.

PG & E's East Bay Division received awards for sales accomplishments in 1958 at a luncheon in Oakland. The record—$7,417,000 in new business. Here Vice-president O. R. Doerr (right) presents the James B. Black award (top for sales accomplishment) to W. Frank Pape, who retired in December as division manager, while Douglas S. Aiken, center, division commercial manager, looks on. At left: Harold F. Carr, new division manager, awards trophy to Henley V. Worthing, Diablo manager, top man in four districts

ed programs, overture music and, for opening night, red carpets from curb to orchestra seats, searchlights playing on arriving stars, an after theatre party, were included. Byron Payne and Ralph Alden were co-producers; Ruth Kruger and Dorothy Bradfield, co-directors.

Promotions

Inland Empire Electrical League is promoting laundry equipment through March. An electric heat promotion started Feb. 18 will run through April.

A TV set a day was given away during Northern California Electrical Bureau's February campaign for the best statements on the theme "TV's more fun with a second one because . . ."

A $30 allowance on wiring for a 240-v electric dryer and a wire-on-time payment plan are customer incentives in the Los Angeles Department of Water & Power's current campaign. Success of the fall range campaign (500 units sold) incorporating the allowance was responsible for its continuation. Also being promoted during the two-month campaign ending March 20 is a 120-v "plug-in" type dryer. Incentives are offered salesmen on either type.

► The homemaker is moving **laundry equipment back to the kitchen,** Norge said, following a survey of its washer-dryer owners. More than 46% using the new combination unit have installed it in the kitchen; 15% in the basement and 31% in the utility room.

► Western division regional managers of **Square D** met recently with headquarters representatives in a two-day sales conference at the El Mirador hotel, Palm Springs, to review past performance and to plan for 1959. Meeting with Vice-president J. H. Pengilly were D. H. Miller, Western division general manager, and these regional managers: R. L. Russell, Los Angeles; Jack Amann, San Francisco; J. Daniel, Seattle; George Helbock, Denver. Among divisional headquarters personnel who attended were: E. Miller, production manager; L. F. Dudley, administrator; W. A. Lewis Jr., product manager; C. Croft, sales coordinator; H. A. Zimmerman, sales manager.

► Chambers Built-Ins Inc., which has a line of electric kitchen equipment, has announced new distributors: **D & R Distributing** Co., 1504 N. Maple, Fresno, Calif.; **Builders Distributing** Co., 312 Yakima Ave., Yakima, Wash.; **Bonnell Refrigeration** Co., 2443 El Camino Real, South Palo Alto, Calif.; **Kitchen Fashions,** 3115 First Ave., Billings, Mont.; **F. H. Kriesler** & Co., 4868 E. 22nd, Tucson, Ariz.; **Kenco Distributing** Co., 1355 Market St., San Francisco; **Custom Kitchens,** 6624 Telegraph, Oakland, Calif.; **Phil Stone** Co., 2121 E. Indiana School Road, Phoenix.

► Electric Living—A Family Affair will be the theme of **Hotpoint's 1959 use-value training meetings** for home economists in the business and educational fields and distributor-dealer sales personnel. Western dates are April 10 at the Olympic Hotel in

Seattle; April 14 at the Fairmont in San Francisco; April 17 at the Hollywood Roosevelt, Los Angeles.

► A $7.6 million program calling for new tools, equipment and for rearrangement of in-plant facilities was announced by **Hotpoint** at Las Vegas during its Mr. Hotpoint of America contest awards. It is planned to spend $5.6 million in the refrigeration and $2 million in the home laundry facilities to allow the company to concentrate on manufacture of larger capacity refrigerators and freezers and to keep pace with the growing demand for home laundry products.

People

John P. Mitchell was named regional manager for the Maytag West Coast Co., with headquarters in San Francisco.

Clarence E. Fink, formerly with Horn & Cox of Los Angeles, has been made regional manager of Hoffman's Consumer Products Division, with an assignment in the East.

Anne Ogden, Portland General Electric Co.'s home service coordinator, was elected director of the Electrical Women's Round Table at the group's annual meeting in Chicago. Mrs. Ogden was first chairman for the Oregon Chapter when it was organized in 1951.

Doris Bowron has been added to the El Paso Electric home service staff to take over range demonstration work.

Arnold O. Wolf, vice-president and general manager of Hamilton Beach, is new chairman of the Electric Housewwares Section, NEMA.

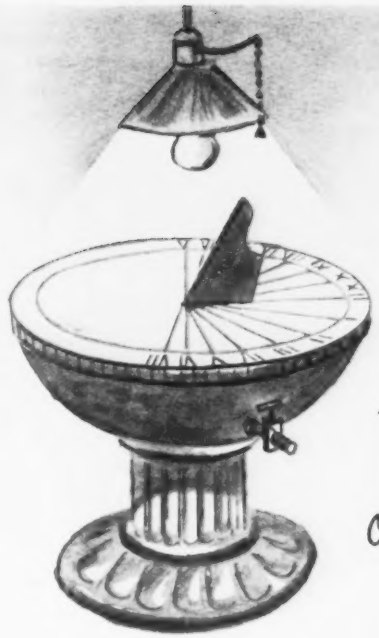
Alan Humphrey, sales representative for Day-Brite Lighting, has been chosen salesman of the year by the Fresno Sales Executive Assn.

Francis Lyman, manager of the Ramsay Co., Hilo branch, died recently in Hawaii of a heart attack.

Top award for improved customer service within the Hotpoint organization went to Jim Gannon, service manager at Fullerton, Calif.

► Four lighting programs, **designed to arm utilities for load building,** have been made available by General Electric Co. They cover recommendations for lighting in industrial plants, bowling centers, supermarkets and advertising (signs).

► Philco has established a special department to handle **appliances for the mobile home industry.** All its products installed in mobile homes will be protected by the same warranty arrangements as those in stationary homes, the company said.



new light on the orientation problem

In the past when we've talked about facing Fisher-Pierce controls in the general direction of north*, the reason given was dependable, repeatable turn-on, month in and month out. Actually, there's an even better reason for northward orientation, and it's well worth the slight effort it takes.

It all comes back to the fact that photoelectric controls are meant to *last*, and not be replaced every year – no matter how "inexpensive" they might be. And if there's one thing that's crucial to long life, it's protection of the photosensitive element from sunlight. The CdS cell in our 6600A is no exception. To give you some idea of just how fast a CdS cell goes to pot once the sun gets at it, we tested some cells with an initial response or sensitivity equivalent to 100%; after 2 or 3 months of basking in the sun, the sensitivity was only 50%, and after less than a year, it had fallen off to 10%. The only sure way we know of to prevent this (without buying new troubles) is to aim the control so the sun can't shine on it – in other words, north. By being directional, a control can also be defended against nearby high intensity lights that could cause accidental turn-off. A few degrees of orientation away from these lights lets the control operate the way it should – instead of just sitting there, helpless and confused.

Orientation problems seem to crop up only in a man-made or natural jungle, where it's anybody's guess which way north is. But in these circumstances, the buildings or trees probably lick the sunlight problem before it starts. If orienting Fisher-Pierce controls does give you trouble, we'd like to hear about it. We may have a ready-made answer, or be able to figure out something to help you. In the meantime, don't let anybody tell you that sunshine – filtered or otherwise – won't eventually raise ned with a control; it will. We've laid to rest some tired *young* cells that prove it. The Fisher-Pierce Co., 43 Pearl Street, So. Braintree 85, Mass.

*Between NW & NE
(Below the equator, between SW & SE)

FP

FISHER PIERCE

PHOTOELECTRIC LIGHTING CONTROLS

AN AFFILIATE OF SIGMA INSTRUMENTS, INC.

Despite a winter storm, this record crowd turned out for the ninth annual Monterey Bay Area Dealer meeting, sponsored by Monterey Peninsula and Salinas Valley Appliance Dealer associations with PG and E. Here C. W. Leihy, publisher of Electrical West, tells the effect of motivation research on consumer buying in his talk, "Revolution at the Cash Register." Seated is Gene Abinante, president of the Monterey association. This was one of many meetings celebrating National Electrical Week

Products

Norge has introduced interchangeable gas and electric wall ovens and surface cooking units to permit builders to standardize design and still offer the consumer a choice of fuel.

Hotpoint is marketing a 6-ft-long Rocket griddle rated at 32.4 kw and capable of producing more than 2,000 hamburgers an hour. It may produce a limited number of three of the six Custom Trend appliances introduced at the Chicago Home Furnishings Show: Swedish Modern range; countertop oven with four pull out surface units; a barbecue center.

Miniature radios using seven and eight transistors and two new portable phonographs have been added to the Westinghouse line. Introduced on a limited basis is a low-priced five-transistor portable radio designed to sell at about $27.50.

Student Scholarships

Portland General Electric Co. will again offer scholarships and merchandise prizes to high school students who build the best projects demonstrating electrical principles or theories, or showing applications of electricity at work.

First prize will be a $500 scholarship, second prize a $250 scholarship. Three runners-up will receive stereophonic sound four-speed record players. Competing students will be sophomores through seniors of high schools in the PGE service area.

The projects were exhibited Feb. 7 and 8 in PGE's Portland Service Center as a part of the National Electrical Week celebration. A two-day open house at the service center was tied in with the observance.

Laundry Equipment Pushed

A three-month washer-dryer sales program, featuring the give away of $3,700 worth of the appliances in an essay contest, has been started in Sacramento metropolitan district by the Sacramento Valley Electrical League, SMUD, manufacturers and distributors.

Sales of washer-dryer combinations in the first nine months of 1958 totaled 1,443, up 24½% compared to the corresponding period in 1957. However, sales of electric dryers in the same period were down 17½%, totaling 5,016 for the nine months compared to 6,080 for the corresponding months last year.

► A direct factory to retailer distribution plan has been set up by **Schick**, effective Feb. 21. Schick recently discontinued trade-in allowances.

SHOW IS A HIT—When Washington Water Power Co. designed the auditorium in its new Spokane service center, it provided theater-type seats, stage and lighting, added full facilities for connecting appliances. However, it purposely omitted a kitchen installation to allow for individual dealer and distributor displays. Pictured here during a one-hour live telecast over KHQ-TV, sponsored by Sears Roebuck, company home economists put on a demonstration watched by 300 in the WWP auditorium and an estimated 45,000 home viewers. Dorothy Smith, center, WWP home economist, said that hundreds of requests for recipes were received following the show. Peggy Lewis of WWP is at left

You gain extra clearance two ways

It's quite possible that the extra 12 inches of pole-top clearance you get from using Varex capacitors could mean the difference between using the existing pole and paying for either a pole extension or a completely new pole.

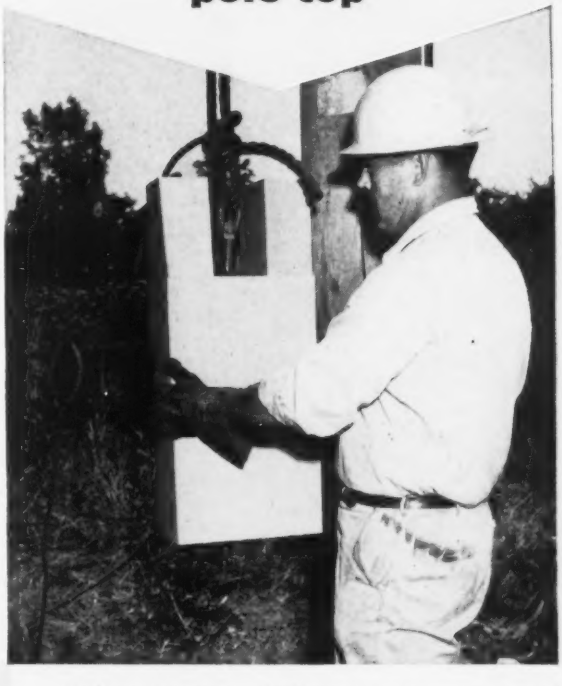
Then there's the saving in installation time. To get the clearance for moving capacitors under the primary and into the rack it's often necessary to move the primary with hot sticks. By using Varex units you may avoid this problem.

You get extra clearance from the Varex design in two ways. Varex 50-KVAR units are as much as five inches lower than other brands. Another six to eight inches of clearance is gained by the central location of the lifting eye between the bushings. Your hook, shackle, or clevis can go right down between the bushings without any space-consuming sling arrangement.

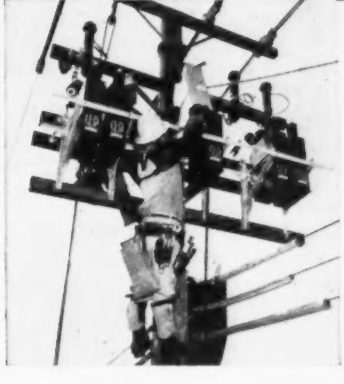
This is just one example of the way Varex designers have kept you, the user of capacitors, foremost in mind. It's another good reason for making sure Varex capacitors are on your standards list.

OHIO BRASS COMPANY, MANSFIELD, OHIO

Low height, central lifting eye make VAREX capacitors easy to install at pole top



Hook goes down between bushings; no sling arrangement needed.



Low over-all Varex height provides extra clearance at poletop.

Ohio Brass

PORCELAIN INSULATORS · LINE HARDWARE · CAPACITORS · LIGHTNING ARRESTERS
BUSHINGS · HOLAN TRUCK MOUNTED POWER DEVICES AND BODIES · BRONZE VALVES

HOLAN

4967-H

SKCABLLAC

Is *Callbacks* Spelled Backwards

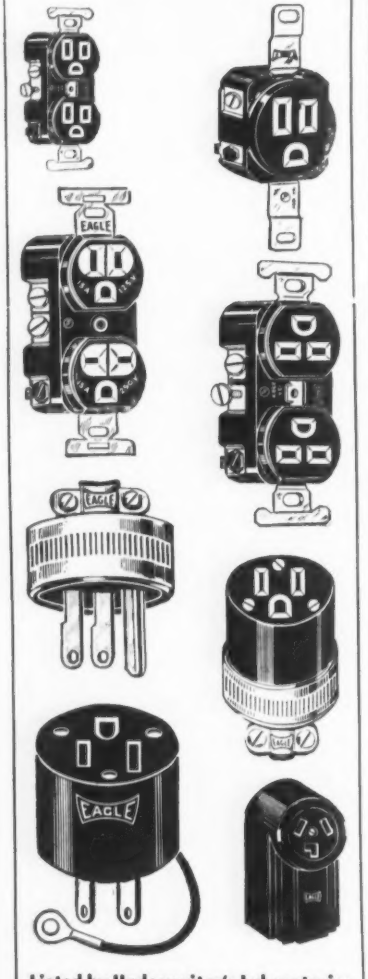
EITHER WAY IT DOESN'T MAKE SENSE — YOU CAN AVOID CALL-BACKS WHEN YOU

SPECIFY AND USE

EAGLE

APPROVED AND PROVED WIRING DEVICES

SOLD THRU WHOLESALERS



Listed by Underwriter's Laboratories

Be sure to visit the Eagle Booth #118 at the Progress in Electrical Equipment Exhibit, St. Louis, Missouri, April 7-8-9.

"Perfection is not an Accident"

EAGLE ELECTRIC MFG. CO., INC.

LONG ISLAND CITY 1, NEW YORK

Manufacturers—Distributors

Merger of S. F. Firms Completed

Merger of Incandescent Supply Co. and Phillips & Edwards Corp. has received final approval. The two San Francisco firms will join under the Incandescent name and will be headed by M. H. Jankelsen, former Incandescent president. E. A. Phillips will be board chairman.

The new organization will have a management corporation in San Francisco and nine operating corporations—in San Francisco, Redwood City, Oakland, Stockton, San Jose, Los Angeles, Fresno, Sacramento, Redding. According to Jankelsen, combined operations will result in annual sales of about $15 million in electrical supplies to contractors and dealers.

► Robert R. Prussia has been made Western regional sales manager for **Electrical Fittings Corp.** Connected with the electrical distribution industry since 1935, Prussia has been with Wesco and in the electrical agency field. He began his association with Efcor in 1941 as a partner in Electric Agencies Inc. of San Francisco. From 1948 to July 1958 he was sole owner of Robert R. Prussia Co. In his new position he supervises agency handling of the Efcor line in the 12 Western states and Hawaii. He also handles trouble shooting and long-range promotional work.

► Willard H. Asdahl is now general manager of the Western Division of the **In-Sink-Erator Mfg. Co.**, maker of garbage disposers.

► White Rodgers Co., manufacturer of controls for heating, refrigeration and air conditioning, has opened **two new West Coast sales and service branch offices** at Los Angeles and Portland to assume duties formerly handled by Pacific Scientific Co. California, Nevada, Arizona and Hawaii headquarters will be at 201 Glendale Blvd., Los Angeles 26. The Northwest area office will be headquartered at 2846 N. E. Glisan St., Portland 12. Resident engineers will be located at San Francisco and Seattle.

► Electrical Specialty Co. of San Francisco is now exclusive representative in the 11 Western states for the **Resistance Wire Division** of the **C. O. Jelliff Mfg. Corp.** Main office is at 158 11th St., San Francisco 3. Branches are headquartered at Los Angeles, Portland, Seattle, Denver and Phoenix.

► Hobart K. Churchill, formerly with the O. A. Sutton Corp., has been named district sales manager for the **Fedders Corp.** in California, Arizona and parts of Nevada. He will service **H. R. Basford Co.** in Los Angeles and San Francisco; **Air Conditioning Distributors,** Phoenix, and **Kool-Temp Inc.,** Las Vegas, reporting to **J. D. Tinder,** Pacific regional manager. His headquarters will be in Los Angeles.

► Graybar will distribute the **Hoffman** TV, radio and hi fi line in Salt Lake City, Boise and San Francisco.

► Pioneer Appliance Co. of San Francisco is now distributor in northern California for **Youngstown Kitchens** Division.

► G. W. Galloway Co.'s **Mechanical Draft Tower Division,** Arcadia, Calif., has been acquired by the **George Windeler** Co. Ltd., San Francisco, maker of industrial wood products. **A. M. Kuehmsted** will head the expanded Cooling Tower Division.

► **Hill Transformer** Co. of San Carlos, Calif., will further expand its marketing facilities into the Midwest and Southwest, Charles Allen Jr., general sales manager, has announced. Presently the H. R. Harris Co. is handling the line in Minnesota, western Wisconsin and the Dakotas; the Charles R. McRay Co. in Oklahoma.

► Formation of an integrated sales organization responsible for three units of Daystrom Inc. has been announced. The new **Daystrom-Weston Sales Division** will be headed by **Wilbert H. Skeinkamp,** vice-president—marketing, and will handle Weston Instruments, Daystrom-Weston Industrial, Industrial Gages.

► **Carlon Products Corp.** of Aurora, Ohio, maker of plastic, pipe and fittings, has opened new production facilities at Compton, Calif.

► Westinghouse has moved its **Electronic Tube Division** regional and district headquarters to 600 St. Paul Ave., Los Angeles. Warehouse and customer pickup facilities will be maintained at 2812 E. 46th St., Ver-

non. The St. Paul Avenue address is also headquarters for the Apparatus and General Products Divisions' South Pacific districts, and the Lamp Division's north Los Angeles district.

► A. R. Bell Co., 746 Haniwai St., Honolulu, has been named exclusive distributor of **Packard-Bell** products in the Hawaiian Islands.

► Union Metal Mfg. Co. of Canton, Ohio, has opened a **Mountain States district office at Denver,** with Clyde H. Cozadd as manager. Sales in Colorado, Utah, Wyoming, Arizona and New Mexico will be handled through the new office at 2700 W. Evans Ave., Denver 19.

► A branch of the **Packard - Bell Service Division** has been set up in Torrance, Calif., according to Carl Duffy, vice-president. Located at 911 Border Ave., the new branch is headed by James Killrakis.

► Appointment of **Dr. Lloyd T. DeVore** to organize a new Hoffman division devoted exclusively to research has been announced by President Leslie Hoffman. Temporary facilities will be established in Santa Barbara while permanent quarters are built.

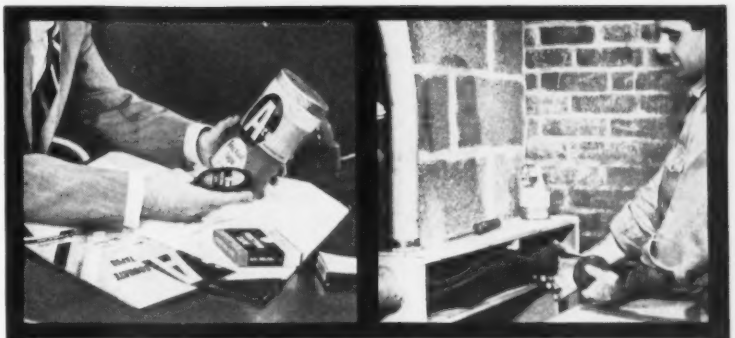
► New location of **Acme Electric** Corp. is 12822 Yukon Ave., Hawthorne, Calif.

► **Associated Consulting Electrical Engineers** has moved to 701 S. Spring St., Suite 810, Los Angeles.

► Howard Johnson of **Thomas & Betts** Co. Inc. has been promoted from Los Angeles district manager to Pacific Division manager. In his new position, he will coordinate activities of the company's Los Angeles, San Francisco and Seattle offices.

► Industrial Engineering & Equipment, Los Angeles, has taken on a new line of photoelectric street lighting control equipment, manufactured by **Precision Magnetic Controls Inc.,** Ridgewood, N. J. Designed for individual multiple street lighting systems, the device has only two moving parts and uses a special grid rather than tubes.

► J. A. Weaver Co. of St. Louis has appointed **Stevens Sales Co.,** 1482 Major St., Salt Lake City, to represent it in Utah, eastern Nevada, southern Idaho and western Wyoming. Weaver makes a line of sol-



They both know the best buy in tape . . .

ACCURATE TAPES
FRICTION . . . . RUBBER . . . . PLASTIC

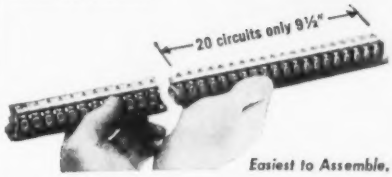
non-raveling
straight tearing
high tensile strength
strong adhesion
highly insulating

Send **today** for our most recent bulletin describing details.

ACCURATE MANUFACTURING COMPANY
Garfield, New Jersey

MD pres-SURE-blocks—DESIGNED for QUICK Assembly and EASY Changes

Quickest to Handle.



Easiest to Assemble.

Simplest to Mount and Extend.

ANY NUMBER OF CIRCUITS — pre-assembled lengths of 20 snap fit circuits (1-1/8" w. x 63/64" h.). No single pieces to handle, pull off or add circuit groups as needed. Single snap-on end section completes block.

HAND ASSEMBLED without hardware; only 2 parts to handle; use mounting screws only every 12 circuits. Channel mounting also available; integral or separable marking strips.

LARGER CAPACITY IN LESS SPACE—#22 thru #8; conservatively rated at 750 volts. Choice of contacts (7/16" o.c.) for stripped or terminal-ended wires (can be combined in single block).

LENGTHEN IN SERVICE without removing mounting screws or losing contact space.

USE FEWER CIRCUITS by grouping common wires—decrease jumpering; no unused contacts.

Greater economy . . . maximum flexibility in installation, wiring, and field servicing.

Write for Bulletin W-3.

STOCKED BY LEADING ELECTRICAL DISTRIBUTORS
BUCHANAN
ELECTRICAL PRODUCTS CORPORATION
HILLSIDE, NEW JERSEY

Represented by
FRED A. PEASE CO. — DENVER, COLO.
KEELER WHITE CO. — SEATTLE, WASH.
KEELER WHITE-PORTLAND — PORTLAND, ORE.
FRANK ROZEMA — COSTA MESA, CALIF.
ALLIED INDUSTRIES — LOS ANGELES, CALIF.
F. M. NICHOLAS CO.—SAN FRANCISCO, CALIF.

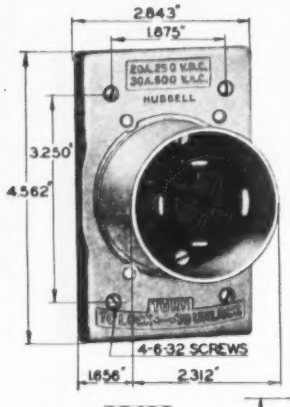
IT PAYS TO HAVE HUBBELL GOOD CONNECTIONS

30 AMPERE

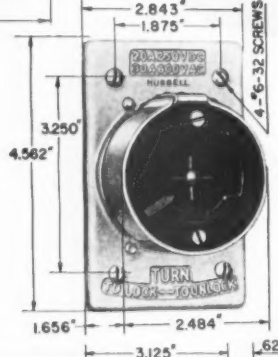
5-WIRE

Hubbellock®

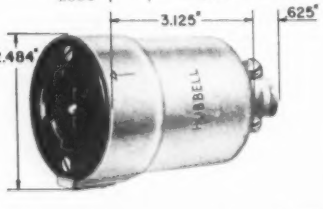
a complete new line of "Hubbellock" devices designed for 4-wire applications requiring additional equipment ground



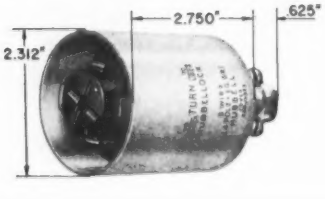
Cat. No. 25418
Male Receptacle with metal housing



Cat. No. 25403
Female Receptacle with metal housing



Cat. No. 25414
Armored Connector Body



Cat. No. 25415
Armored Male Cap

HARVEY HUBBELL, INCORPORATED

BRIDGEPORT 2, CONNECTICUT

WIRING DEVICE OFFICE AND WAREHOUSE LOCATIONS

Bridgeport 2, Connecticut
State and Bostwick Streets

Chicago 7, Illinois
37 South Sangamon Street

Los Angeles 12, California
103 North Santa Fe Avenue

San Francisco, California
1675 Hudson Avenue

IN CANADA:
Scarborough, Ontario,
1160 Birchmount Road

derless connectors, ground rods and service entrance equipment.

► Phelps Dodge Copper Products Corp. has opened a **district sales office in Denver** with Fred K. Packard as district manager. Packard, who was transferred from New York headquarters, said the Denver office will handle the sale of insulated wires, power cables and copper base alloy tubes, rods and wire in Colorado, Wyoming and New Mexico.

► Four members of the staff of the **Don Burcham** Co., Portland, attended a sales meeting in Scottsdale, Ariz., at which VM Sales Corp. introduced a line of dual channel stereo phonographs and a stereophonic dual channel 45-rpm record changer. W. E. Earl, W. E. Earl Jr., R. M. Loughray and Charles Johnson attended the four-day session.

► **Reliance Electric & Engineering** Co.'s Arcade, a traveling exhibit of the company's products, was in Oregon last month, according to John Shaffer of Shaffer & Nelson Inc. The exhibit is to be in the San Francisco and Los Angeles areas until the end of April.

► Moe Levin of **M. Levin** & Co., Eagle Electric Mfg. Co.'s representative in the Northwest, was awarded its gold "eagle" pin for topping the nation in January business volume.

► Dale G. Weber Co., 8 S. E. Clay St., Portland, has been appointed to represent the **KLH Research & Development** Corp., 30 Cross St., Cambridge, Mass. The KLH organization manufactures a new type of loud speaker intended for high quality stereo hi-fi installations. The Weber Co. has also become representative for the Thorens Co., Swiss manufacturer of phonographs and turntables.

► Broadening its field marketing organization, **Cutler-Hammer** has established five regional sales districts and increased district sales offices. The Western region includes the Denver, Los Angeles, San Francisco and Seattle districts. **R. C. Seibert** has been made regional sales manager and **W. H. Palin** has taken over Seibert's former post as Los Angeles district manager.

► T. J. Vieau & Associates of Denver will represent **Feedrail** Corp. in Colorado, Wyoming and New Mexico. Headquarters are at 1871 S. Broadway, Denver 10.

An adjustable dead-end fitting for 1,590 mcm, 45x7 ACSR conductor, with a turnbuckle to take up sag, was one of many special fittings shown to utility engineers and line contractors in a series of meetings by the Thomas & Betts Co. Jack Klosin, utility manager, sales and engineering for T&B from Elizabeth, N. J., showed them to large turnouts in Seattle, Portland, San Francisco and Los Angeles. Above at Los Angeles: Arthur Munroe, T&B; Kenneth White, Graybar; Jack Klosin; Howard Johnson, division manager

Management Changes

Six executives in two divisions of Columbia Electric & Mfg. Co. in Spokane have been promoted to newly created vice-president posts.

Walter L. Haspedis was named vice-president in charge of sales, Edward M. Caferro vice-president in charge of manufacturing, and William A. Ware vice-president and controller. All three are in the manufacturing division of the company.

In the wholesale division, Milton Tschache was made vice-president and treasurer, Ed Ralph vice-president and manager of supply materials, and William Bigelow vice-president and manager of the electronics department.

In a year-end report Eric A. Johnston, board chairman, said sales volume increased 30% during 1958 compared with 1957.

► Matzinger-Johnson Co., 1329 Willow St., Los Angeles 13, is representing **Electro Compound** Co., maker of wire pulling lubricant. Territory includes southern California, Nevada and Arizona. Another new Matzinger-Johnson account is the **Dossert** Mfg. Corp. of Brooklyn, N. Y. It will represent this manufacturer of electrical connectors in southern California, Arizona and Clark County, Nev.

► In organizational shifts to increase corporate efficiency, **General Electric** Co. has dissolved two product divisions—Measurements and Industrial Products, West Lynn, Mass., and Construction Materials, Bridgeport, Conn. Under resulting department reassignments, the Oakland, Calif., plant, formerly under the Wire and Cable Department, will be a part of the Chemical and Metallurgical Division, Pittsfield, Mass.

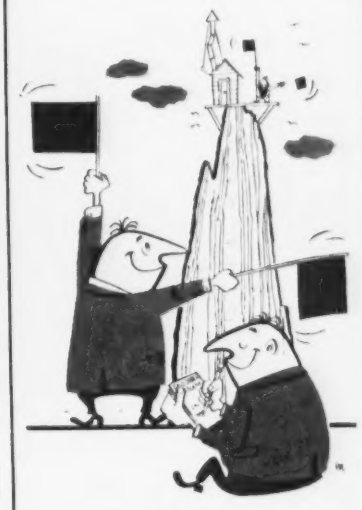
► McCracken-Ripley Co., 2221 N. Albina Ave., Portland, is now distributing **Thor** portable electric power tools in Oregon and southern Washington.

West Coast Firms Merge

Yuba Consolidated Industries Inc., San Francisco, has purchased Southwest Welding & Mfg. Co. of Alhambra, Calif., it was announced jointly by J. L. McGara, president of Yuba, and John W. Lucas, president of Southwest.

Southwest Welding, with plants in Alhambra and Richmond, Calif., offers service for the engineering, fabrication and field construction of heavy equipment for the atomic energy, petroleum, chemical, power and hydroelectric industries. It is especially active in the fabrication and installation of large diameter pipe and penstocks in the power and hydroelectric fields. Its annual sales volume approximates $12 million.

Southwest will operate as a subsidiary of Yuba and Lucas will remain active in its management, McGara stated.



OUR SALESMEN LOOK FOR BUSINESS EVERYWHERE

But just in case they've missed you, remember Incandescent Supply Co. has really complete facilities.

If it's electrical, you'll find it at ISCO . . . with service that compliments the best in quality.

INCANDESCENT SUPPLY CO.

OAKLAND
REDDING
SACRAMENTO
SAN FRANCISCO
SAN JOSE
FRESNO
LOS ANGELES

► Monson Electric Co. will represent **Dage Television** Division of Thompson Ramo Wooldridge in California. Monson headquarters are at 360 Sixth St., San Francisco; its Los Angeles office is at 1420 W. Ninth St. Dage, maker of industrial and educational TV systems, has a factory office at 204 Hindry Ave., Inglewood, Calif.

► J. A. Weaver Co. of St. Louis has appointed the **George E. Metcalf** Co., 2044 Ash St., Denver 7, to represent it in the states of Colorado, Wyoming and Montana. Weaver makes a line of connectors, ground rods and service entrance equipment.

► Don H. Burcham Co., 510 N. W. 19th Ave., Portland, has added three people to its sales staff. **Robert Hansen,** sales engineer, will work out of Seattle. **Carl Friedli** has joined the field staff in Portland. **Al Hansen** will be an inside salesman in Portland.

► James L. Kearns Co., 6055 N. E. Glisan St., Portland, now engaged in an expansion program, has incorporated as **James L. Kearns Co. Inc.**

► Jerrold Electronics, represented in the Northwest by **Don H. Burcham Co.,** is starting a large advertising campaign on its new amplified TV home system, combining a small amplifier and a roof antenna to supply plug outlets. The campaign will be aimed at contractors and building supply houses.

► Moe Levin of **M. Levin Co.,** Portland, attended the annual sales show staged by Yakima Hardware Co., in Yakima, Wash., recently.

► A. E. Thompson is representing **Smithcraft** in the states of Colorado and Wyoming. Formerly in the lighting sales agency field in San Francisco, Thompson is now headquartered at 2232 S. Meade St., Denver 19.

► **Joseph L. Singleton,** vice-president, Industries Group, Allis-Chalmers, has been re-elected president of the National Electrical Manufacturers Assn.

► **T. R. Van Wagoner Co.** will represent **R T & E** in the Salt Lake City area, handling its line of transformers for overhead and underground distribution. R T & E's Portland plant, which made the announcement, said the Utah firm's offices are at 1415 S. Main St.

People

Yetter

Sargent

Executive Changes

Reassignment of two executives has been announced by R. T. Person, president of Public Service Co. of Colorado.

Paul A. Yetter, who has been vice-president of division operations, was reassigned to vice-president in charge of the company's public relations activities. Ralph Sargent Jr. was appointed manager of division operations to succeed Yetter. Sargent has served as assistant to the president since April 1956.

► **C. Alex Manson,** assistant general sales manager since 1956, has been appointed chairman of British Columbia Electric's rate committee at Vancouver. His new title will be rate engineer.

► **Dave Knight** is now superintendent of system operations for Puget Sound Power & Light Co., succeeding the late **Charles Monson.** Post of the late Mr. Monson have been assigned to Gene Bush, who has the new title of power planning engineer. In another promotion, Larry Hall, engineer, became assistant to the operating manager.

► **Ian R. A. Mills** has been appointed director of finance for British Columbia Power Commission. He was formerly with the internal audit branch of MacMillan & Bloedel, but joined BCPC last October to succeed **J. A. Christie,** who retired.

► **A. A. Straub** has been named superintendent of communication for Southern California Edison Co. He was formerly chief substation engineer.

► **Mitchell Doumitt** is the new manager of the Wahkiakum County PUD, Wash. A former district attorney of the county, he resigned as an assistant attorney general to take the position. He succeeds **Alvar Hendrickson.**

► **Delmar L. Brown,** superintendent of the testing department for Portland General Electric Co., has been elevated to the grade of Fellow in the American Institute of Electrical Engineers. His citation states "for contributions to testing and performance of power system components."

► **Donald S. Burns,** president of Lighting Dynamics, has been elected a vice-president of the parent corporation, Ekco Products Co.

► **Chester H. Dye,** manager of area development for the Los Angeles Department of Water & Power, has been appointed to the board of directors of the American Industrial Development Council. He will represent California and other West Coast states in council meetings.

► **Andy Tuskas** and **Dale White** are new salesmen with the Clark Controller office in Los Angeles. Tuskas, who has 17 years with Clark Controller, has transferred from the Cleveland sales office and will be responsible for the territory immediately north of Los Angeles. White is new with the company, and will have the territory south of Los Angeles.

Leeds & Northrop Changes

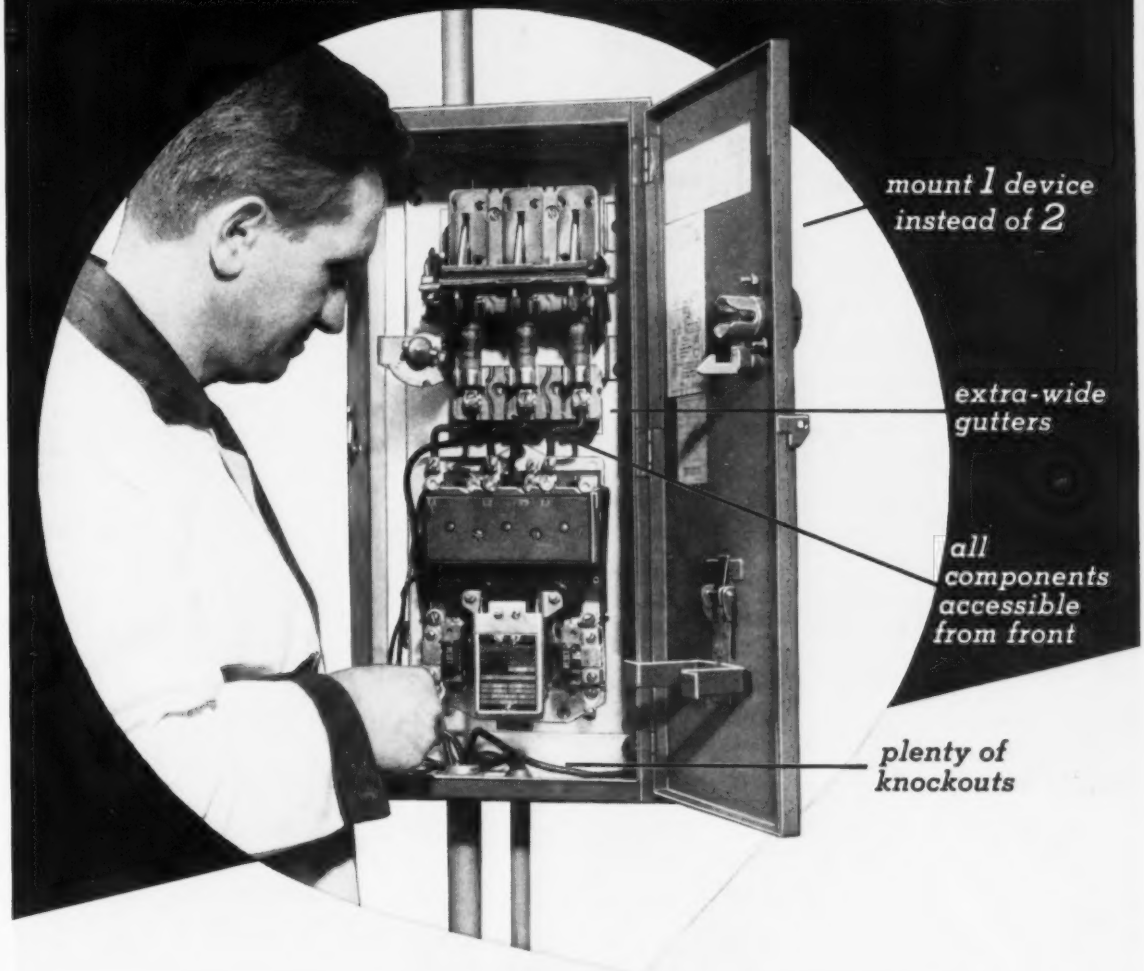
Forest Rucker moves from Los Angeles to head up the Leeds & Northrop marketing development department in Philadelphia. He will be succeeded as manager of the Los Angeles office by Strat Biddle, who moves from Seattle.

Moving from Salt Lake to Seattle is Jack Reed, to take over Biddle's position as office manager. Bob Failor moves to Salt Lake City from San Francisco to succeed Jack Reed.

► **Claude E. Beardslee** and **Charles Hybarger** are new field engineers with Robertshaw-Fulton Controls Co., Anaheim, Calif. **J. F. Tobias** has been appointed director of the electronics unit of the aeronautical and instrument division. **Dawson E. Teaford** has been named sales manager of instruments.

► **Gerald C. Alexander,** assistant professor of electrical engineering at Oregon State College, has been awarded a faculty fellowship by the National Science Foundation. He will spend next summer studying at the University of Wisconsin, and the 1959-60 school year at Massachusetts Institute of Technology under the fellowship.

EASIER TO INSTALL AND MAINTAIN!



SQUARE D COMBINATION STARTERS

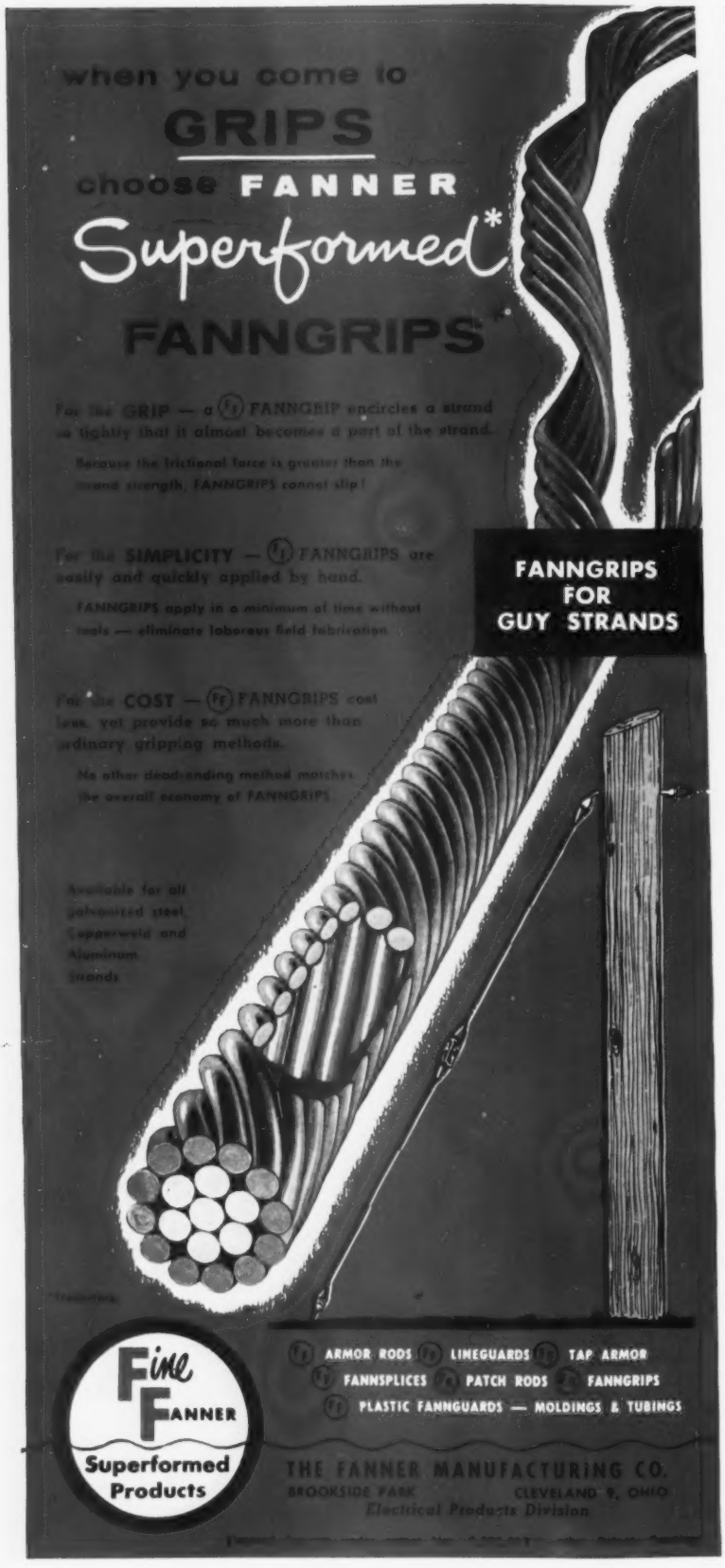
(Switch or Circuit Breaker Types)

Save space and time. Mount and wire one device instead of two . . . neater, more attractive installations.

Write for Bulletins 8538 and 8539
Square D Company, 4335 Valley Boulevard, Los Angeles 32, California

NOW...EC&M PRODUCTS ARE A PART OF THE SQUARE D LINE!

SQUARE D COMPANY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choose FANNER
Superformed*
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For the GRIP — a (FF) FANNGRIP encircles a strand so tightly that it almost becomes a part of the strand.
Because the frictional force is greater than the strand strength, FANNGRIPS cannot slip!
For the SIMPLICITY — (FF) FANNGRIPS are easily and quickly applied by hand.
FANNGRIPS apply in a minimum of time without tools — eliminate laborous field fabrication.
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No other dead-ending method matches the overall economy of FANNGRIPS.
Available for all galvanized steel, Copperweld and Aluminum strands
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Fine FANNER
Superformed Products
THE FANNER MANUFACTURING CO.
BROOKSIDE PARK CLEVELAND 9, OHIO
Electrical Products Division

Accounting Changes

Changes in personnel and organization have been made in the accounting division of Los Angeles Department of Water & Power.

Sam Kazerman is now assistant controller and chief accountant, succeeding S. K. Velliquette, who has retired. Kazerman's former position as head of the cost and general accounting section is being filled by Edward Mandeson, former staff accountant.

At the same time, the department revealed that machine accounting and methods, which had been a function of the accounting division, would now become a separate administrative division.

► **E. L. Crowe** has been appointed controller of Fluor Products Co. In this position he will be responsible for all of the company's accounting and budgeting.

► **Donald L. Jordin,** farm sales supervisor for Washington Water Power Co., has been named to fill the newly created post of agricultural engineer. He will assist in the planning, development and coordination of agricultural activities with community, civic, farm and industrial leaders.

► **Raymond W. de Lancey,** assistant Portland District engineer, has been promoted to the rank of colonel. He is in charge of operations and administration.

► **Albert W. Pettit** has succeeded William H. Kelly as supervisor of employment at Westinghouse Electric Corp.'s Sunnyvale division. Kelly retired recently.

► **John F. Roberts Jr.** is now manager of the rate department for Pacific Gas and Electric Co. He succeeded Rudolph Jenny, who retired after nearly 47 years with the company.

► **John Mutschler** has been appointed factory superintendent for Touch-Plate Mfg. Corp., Paramount, Calif. The appointment coincides with the company's recent program of plant facility expansion that will double existing production space, according to Art Linkletter, president.

► **William L. Pierce,** who has service with Edwards Co. Inc. in both Los Angeles and San Francisco, has been named southern regional manager of the company.

DAZZLING NEW LINE OF FIVE FAST SELLERS!

THE SIZZLING NEW

Spiralite

PROMOTION BY **MOE LIGHT**

Sculptured polished brass beauties with exciting perforated patterns and smart black disk trim. Designed and priced to make sales history for you!

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Full Pages in Color:

House & Garden — April

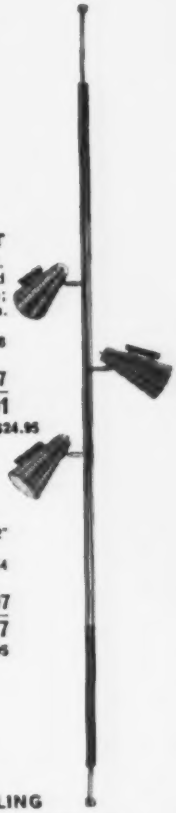
House Beautiful — May

Reaching 7,950,000 Readers!

SPECIAL SALE PRICES!

M-1579 PULL-DOWN
Shade 18" wide. Adjusts 25" to 58"
Regular dealer price $23.31
Dealer SALE Price 17.97
YOU SAVE $5.34
Special retail sale price $29.95

M-1577 CLUSTER
Diameter each cone 5"; over-all diameter 18". Each cone adjustable to 46".
Regular dealer price $19.98
Dealer SALE Price 14.97
YOU SAVE $5.01
Special retail sale price $24.95



M-1400 POLE LIGHT
Adjusts from 7'9" to 9'. Comes with 9' cord and plug. Each cone 9" long; swivels up, down, sideways. 3-way switch.
Regular dealer price $19.98
Dealer SALE Price 14.97
YOU SAVE $5.01
Special retail sale price $24.95

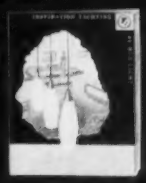
M-1572 PENDANT
Diameter 5". Adjusts to 72" over-all.
Regular dealer price $8.64
Dealer SALE Price 5.97
YOU SAVE $2.67
Special retail price $9.95

M-1575 CLOSE-TO-CEILING
Sculptured polished brass with white ceramic-decorated glass. Diameter 11¾"; depth 5".
Regular dealer price $6.64
Dealer SALE Price $4.77
YOU SAVE $1.87
Special retail sale price $7.95

Introductory sale prices end May 31, 1959

FREE MERCHANDISING AIDS!
- FREE mats for local newspaper use.
- FREE color poster—big blow-up of national ad.
- FREE "Spiralite" fixture tags for extra sales.

SEND NOW FOR NEW 1959 CATALOG. 52 PAGES IN FULL COLOR (including "Spiralite")



THOMAS INDUSTRIES INC.
LIGHTING FIXTURE DIVISION
Executive Office: 410 S. Third St., Louisville 2, Ky.

THOMAS INDUSTRIES INC., Lighting Fixture Division
410 So. Third St., Louisville 2, Ky., Dept. EW-3

☐ Rush new MOE Light Catalog and Lighting Guide, plus full details of new "Spiralite" promotion.

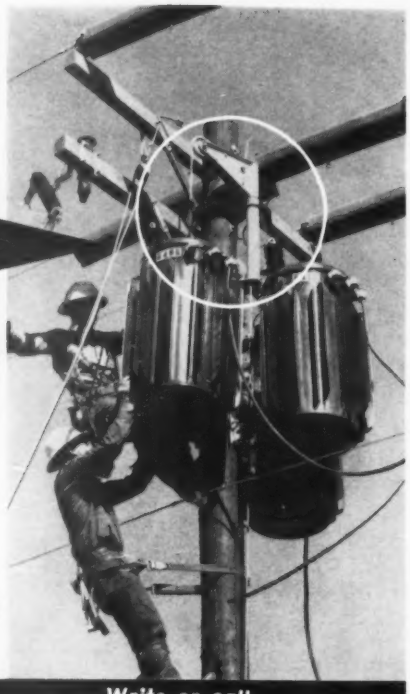
☐ Have my distributor salesman call on me.

Name_____
Company_____
Address_____
City_____ Zone_____ State_____
My distributor is_____

Cut costs...
Provide greater safety
with a MO PE CO
Transformer Hoist

- One position base mounting
- Swivel head permits multiple mounting
- Lightweight 2 piece portable unit (42 lbs.)
- Assembles easily at top of pole
- Tested at 3000 lbs. lift on cable
- Uses steel cable or manila rope

Save time with the MoPeCo hoist. You can install 3 transformers in only 30 minutes!



Order through your favorite distributor

Write or call
MORRISON-PELSUE CO.
Denver, Colorado
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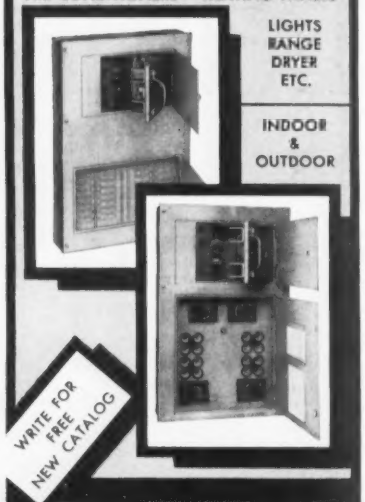
200 AMPERE
HOUSEPOWER
FUSIBLE OR CIRCUIT BREAKERS
CONTROLS FOR WATER HEATER
AIR CONDITIONERS — HEATING PANELS



The WADSWORTH Electric
MFG. CO., INC.
COVINGTON, KENTUCKY.

Manufacturers' Directory Additions and Corrections

MEARS ELECTRIC CIRCUIT BREAKERS, INC., Portland, Ore.—Artwel Electric, Inc., 1485 Bayshore Blvd., San Francisco 24; Roy Peck Associates, 103 N. Santa Anita Ave., Arcadia, Calif.

ROWAN CONTROLLER CO., 2400 Homewood Ave., Baltimore, Md.—Artwel Electric Inc., 1485 Bayshore Blvd., San Francisco 24.

CAVALIER CORP., Electric Heater Div., Chattanooga—No longer represented by Jim Shirreffs Co., Los Angeles.

SWAN MFG. CO., Vecto-ray, Vancouver, Wash.—Represented by Jim Shirreffs Co., 3601 S. Broadway Pl., Los Angeles 7.

MURRAY MFG. CORP., New York—Western Branch office: 6115 Selma Ave., Los Angeles; Blakeman Brothers Mfg. Co., 5859 Compton Ave., Los Angeles.

BIRNBACH ARDIO CO. INC., New York City—Sinai-Johnson, Inc., 845 Jessie St., San Francisco.

LUMINOUS CEILINGS, INC., Chicago, Ill.—Pacific Associated Lighting, 1260 Pennsylvania Ave., San Francisco.

Representatives:

Pacific Electric Sales Co., 140 S.E. 28th Ave., Portland 14 represents the following:
BELL ELECTRIC CO., Chicago
ELECTRIC TUBE PRODUCTS, INC., Maspeth, N.Y.
MASON CO., L. E., Boston, Mass.
MERCURY PRODUCTS, INC., Guilford, Conn.
NORTH CENTRAL PLASTICS, INC., Ellensdale, Minn.

McLaren & Associates, George L., Prefontaine Bldg., Seattle, represents the following:
WILMINGTON FIBRE SPECIALTY CO.
ERIE BOLT & NUT CO.
H. K. PORTER CO. INC. of Somerville, Mass.
EAGLE MFG. CO.
WITT CORNICE CO.

Deaths

► **Otis E. Johnston,** 46, an electrical engineer with Bonneville Power Administration since 1939, and his son, Wayne, 16, drowned recently when their boat was swamped in rough water in the Columbia River.

► **John H. Blomquist,** 60, former editor of Utah Power & Light Co.'s magazine *The Circuit*, died of a heart ailment in January. He had worked for Utah Power & Light for 30 years, and won several awards for the magazine before retirement in 1952.

► **George R. Corey,** 71, veteran official of Utah Power & Light Co., died in a Salt Lake hospital in January after a lingering illness. He had retired from the position of executive vice-president and secretary in 1957 after 44 years of service, but continued his association with the firm as a consultant.

► **John H. Quense,** 80, retired civil engineer who supervised design and construction of Seattle City Light's Diablo Dam, died in late December. He received degrees in civil engineering and mechanical engineering from the University of Minnesota in 1901 and 1902. He joined Seattle City Light in 1906 as a draftsman, and stayed in the engineering department until his retirement in 1947. He was principal supervising engineer in the design section when he retired.

► **Robert Ehorn,** regional sales manager for Lighting Dynamics, Whittier, Calif., lost his life in an automobile accident in Mexico Dec. 10.

► **A. L. Drew,** former chief electrical inspector of Las Vegas, died in Washington, D. C., recently.

► **Pat Powers,** last surviving member of IBEW Local 125, Portland, died Dec. 24. A Portland General Electric employee until his retirement in 1945, he was one of the 10 who signed the union's charter Oct. 12, 1900.

► **Wesley Baker,** San Francisco electrical contractor and former president of the San Francisco NECA group, died recently.

► **Clyde H. Clark,** 71, assistant purchasing agent for Pacific Power & Light Co. when he retired in 1948, died recently in Portland.

Association Affairs

IAEL Coming West For National Convention

Entertainment plans are well in hand for the national convention of the International Association of Electrical Leagues to be held in San Diego at El Cortez Hotel Aug. 10-15. The business program itself is in charge of a committee and has not yet been announced. However, J. Clark Chamberlain, manager of the Bureau of Home Appliances of San Diego County, is host and is making elaborate plans for the visit of league managers and executives of the industry. Among them are a trip to Mexico, a tour of the General Atomics plant. Chamberlain also promises that there will be a large attendance of local industry people. It will give them an opportunity to learn first hand of what the national promotional programs are to be.

Contractor Conference

In San Diego a meeting is a "three-ring circus." At least when the Bureau of Home Appliances holds one. So when its Contractors Division held its annual dinner meeting, in Balboa Park, Jan. 22, it had a table top exposition of 40 manufacturers' products for contractors, a dinner and a peppy, fast moving program. It even had a clown, William A. Cyr, consulting editor of ELECTRICAL WEST, to buffoon the industry for a few laughs.

Arranged by Alan McCutcheon Jr., coordinator, the program opened with the praising of retiring officers and installation of the new, headed by Norman Ferguson, president of California Electric Works. New vice-chairman is Robert W. Davies, Davies Electric Co. The board also has Mason Baity, Kinmore Electric; Walter Chapman, San Diego Gas & Electric Co.; F. X. Delano, Electric Supplies Distributing Co.; David Engel, Sunlight Electric Supply; Ward Howard (past chairman), La Mesa Electric; W. L. Larson, Elevator Electric; T. N. Murphy, G-E Supply; E. C. Phillips, Coast Electric; Bailey Poor, Western States Electric; R. T. Redfield, Graybar; Ralph Rohrbach, Pacific Wholesale Electric; Hilton Stine, Atlantic Electric; and Ted Verdugo, Verdugo Electric.

An inspiring address, appreciating

New *Subscription* Rates for Electrical West

Effective Jan. 1, 1959

	U. S. and U. S. Possessions	Canada	Latin America and Philippine Islands	Foreign
1 year	$3.00	$3.50	$4.00	$4.00
2 years	4.50	5.00	5.00	6.00
3 years	6.00	7.00	7.00	8.00

Domestic club rate: $1.50 per year (not less than 5 subscriptions) U. S. only

Canadian club rate: $2.00 per year (not less than 5 subscriptions)

SAVE MONEY—ORDER NOW!!

ELECTRICAL WEST

68 Post St. **San Francisco 4, Calif.**

"Blue Chip" Products for Volume, Prestige and Profit

CORNISH

CORDS and CORD SETS

for Home, Farm and Industry

Plastic, rubber, neoprene Service Cords in 250-ft. spools, individually cartoned in boxes-of-four for convenience in handling. Loose-wound cord sets, relaxed to forestall ozone attack.

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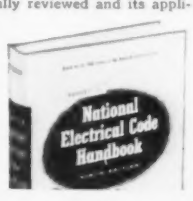
Now in Revised 9th Edition!

ABBOTT'S NATIONAL ELECTRICAL CODE HANDBOOK

Here is the electrical contractor's job book, **completely revised** to conform with the 1956 Code requirements—designed to help you understand and do work in accordance with the National Electrical Code. In this handbook you will find explanations of rules and measurements for the various types of jobs—what they mean—how to apply them. Wherever a ruling lacks clarity, it is carefully reviewed and its application explained. Diagrams, sketches, and illustrations used freely. 9th Ed. Revised by C. L. Smith. 642 pp., 194 illus., 34 tables, $8.00.



10-day Free Examination

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327 West 41st St., New York 36, N.Y.

Send me Abbott's **National Electrical Code Handbook**—9th Edition for 10 days' examination on approval. In 10 days I will remit $8.00 plus few cents delivery; or I will return the book postpaid. (We pay delivery costs if you remit with this coupon—same return privileges.)

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For price and terms outside U.S. write McGraw-Hill Int'l, N.Y.C. West 3/59

Panel of manufacturers—Frank Lee, G-E Lamp; Skip Warren, Rome Cable; E. C. Phillips, Coast Electric, moderator; Martin Luskin, Federal Pacific; and William Markel, NuTone, who outlined business opportunities for contractors at San Diego meeting

the part that all segments of the industry play in making living better electrically, was given by the new chairman, Ferguson. He urged all to understand the functions of the other branches and to help make them work better. "Build with them," he pleaded, "don't knock."

A manufacturers' panel was a feature of the program. Frank Lee, General Electric Lamp Division, told of the potential business in lighting under the new recommended levels. Skip Warren of Rome Cable emphasized the adequacy of circuiting. Martin Luskin of Federal Pacific told how the makers of panels are even dolling them up to add to their sales appeal. William Markel of NuTone presented the many built-in lighting, heating and appliance devices that can be sold.

R. J. Phillips, vice-president of sales, San Diego Gas and Electric Co., congratulated the organization for its outstanding example of intra- and inter-industry cooperation. Dave Engle outlined the plans for the contractors exhibits at the spring fair.

Alan McCutcheon holding trophy awarded Ward Howard, retiring chairman (not present), by new Chairman Norman Ferguson, California Electric Works, upon taking office

Attendance was 282, with the largest number of contractors present that have attended any meeting of the division.

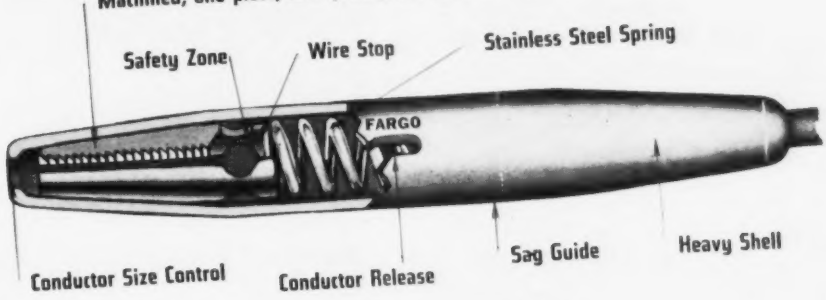
New chapter, new leaders—San Mateo Chapter, NECA, was formed last month from the former Peninsula Electrical Contractors Assn., a division of the San Francisco association. And, with its new name, these men were elected to guide it: seated—Stan Fitchen, Safe Electric, treasurer; Carl Porter, Biber Electric, vice-president; Everett Marshall, Marshall Electric, president; standing—William Gillard, Gillard Electric; William Regler; Ernest Canette, R. C. Electric; all of them directors

► Rocky Mountain Chapter, National Electric Contractors Assn., elected Harris Steele as its 1959 president; Dale Strohminger, vice-president; Steve Strong, secretary; E. C. Armstrong, treasurer; and J. E. Collier, governor. Directors are Roy Kennedy, Ralph Johnson, Karl Krummel, Ernest Graham, Charles Band, Forest Quelvog and Walter Neill; R. E. Stephenson, Boulder; Robert Dove, Casper; C. H. Simpson, Cheyenne.

REGC

Rural Electric Generating Cooperatives Assn. will hold its tenth annual operating conference in Albuquerque, at the Hilton, April 6-9. There will be numerous panel discussions of operating problems and speakers on both steam and diesel generation will address the group. Presidents, managers, plant superintendents and chief engineers from all parts of the United States, including Alaska, will attend.

The inside story...



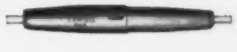
ALUMINUM OR COPPER

Fargo Line Splices

Quick as a wink you've automatically . . . without tools . . . made a permanent connection with a Fargo Line Splice and saved time and money in the bargain. Inside the tough copper (or aluminum) shell is a fool-proof, precision engineered, gripping jaw that works right every time. It's the inside story that counts . . .

The famous Fargo one-piece jaw with four segments assures perfect alignment for a sure grip on the conductor. Mechanically, it can't be beat, and electrically, the splice including contact resistance, has greater conductivity than an equal length of conductor.

"Automatic" Messenger Splices



"Automatic" Reducing Splices

"Automatic" Insulated Splices

Fargo "Automatic" Line Splices are available in a wide choice of types and materials. There are types available for aluminum or copper conductors, reducing splices, insulated splices, messenger splices . . . dead ends, too.

You'll save time, money and headaches on new construction, and emergencies, with Fargo Automatic Line Splices.

Ask your Line Material Field Engineer for complete details.

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Manufactured by
FARGO MFG. COMPANY, INC.
Poughkeepsie
New York

FARGO

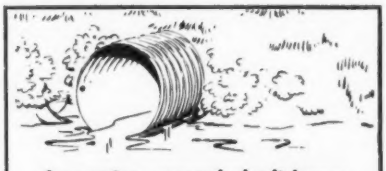
In Idaho Power's brand new East Gate Substation at Twin Falls, Idaho, CM-OT control cable is used on control circuits involving transformers, regulators, metering devices and circuit breakers. Much of the equipment is located in the yard, with cables going underground and up into the main control board.

"We expect 30 years' service from this direct-burial cable," says Idaho Power Company

On its substations along the Snake River, Idaho Power Company uses a direct-burial cable that eliminates the need for conduit or pipes . . . provides complete resistance to soil alkalinity, severe temperature fluctuations and active rodents, as well as excellent mechanical protection.

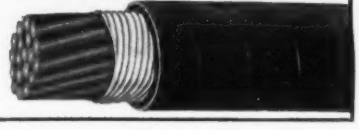
It's Okonite's control cable with CM-OT (Patent No. 2722562) finish—a lightweight, flexible cable of great compressive strength. Heart of CM-OT construction is a corrugated bronze tape that gives unusually high compressive strength. The corrugated tape is bonded to a tough wall of Okoprene, reinforced by an Okoprene-filled tape overall. This composite covering provides a permanent barrier against rodents, moisture, soil alkalies, acids, oils, sunlight or mechanical damage.

It will pay you to learn more about CM-OT quality cable constructions with corrugated bronze tape protection. Send for Bulletin WE-1121, The Okonite Company, Passaic, New Jersey.



Corrugation = strength plus lightness

Just as corrugated construction adds strength to underground pipes, so corrugation of shielding tape permits the construction of CM-OT—the stronger, lighter, more flexible and more easily handled cable.



where there's electrical power . . . there's **OKONITE CABLE**

6201

Meetings Calendar—1959

MARCH

24-26—*Electrical Maintenance Engineers Assn. of So. Calif.*, biennial conference, Los Angeles, Calif.

30-31—*PCEA*, Engineering & Operating Section conference, Hotel Lafayette, Long Beach.

APRIL

6- 9—*Rural Electric Generating Cooperatives*, 10th annual operating conference, Hilton Hotel, Albuquerque.

8- 9—*PCEA*, Administrative Services Section conference, Hotel Lafayette, Long Beach.

19-21—*Rocky Mountain Electrical League*, spring conference, Continental Motor Hotel, Denver.

22-24—*Northwest Electric Light & Power Assn.*, Engineering & Operating Section, Personnel and Safety Section, Purchasing Committee, Hotel Utah, Salt Lake City.

24-25—*Rocky Mountain Electrical Manufacturers Representatives Club*, Electrical Exhibit, Tower Merchandise Mart, Denver.

24-29—*Bureau of Home Appliances of San Diego County*, Spring Fair, Balboa Park, San Diego.

23-May 1—*International Association of Electrical Inspectors*, annual meeting of Idaho, Utah, Montana and Nevada Chapters.

27-29—*National Assn. of Lighting Maintenance Contractors*, annual conference, Hotel Cosmopolitan, Denver.

MAY

6- 8—*Institute of Radio Engineers*, regional conference and trade show, University of New Mexico, Albuquerque.

11-12—*Illuminating Engineering Society*, Intermountain region conference, Hotel Continental, Denver.

18-20—*NELPA*, Business Development Section, Advertising and Public Relations Committee, Rate Research Committee, Multnomah Hotel, Portland.

20-22—*PCEA*, annual convention, Hotel Fairmont, San Francisco.

24-27—*AIEE-ISA-ARS-IAS*, Telemetering Conference, Brown Palace and Cosmopolitan Hotel, Denver.

25—*Northwest Public Power Assn.*, annual membership meeting, Hotel Olympic, Seattle.

26-29—*IES*, Pacific Northwest region conference, Banff Springs Hotel, Banff, Alberta, Canada.

26-28—*American Public Power Assn.*, annual national convention, Hotel Olympic, Seattle.

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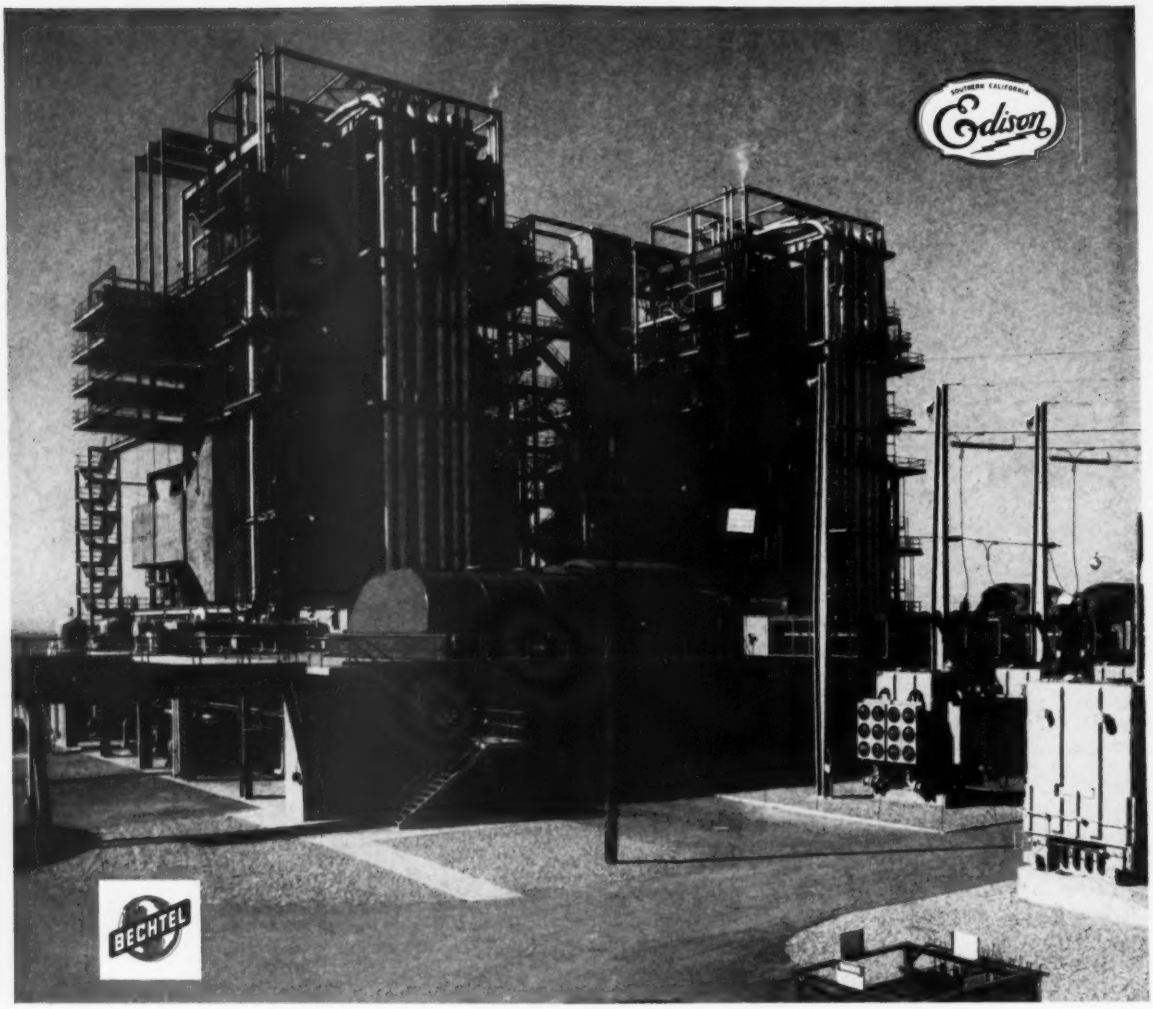

HUNTINGTON BEACH PACES EDISON'S GROWTH CURVE

The new Huntington Beach Steam Plant of Southern California Edison Company exemplifies the forward-looking policies by which the company contributes so importantly to California's growth.

The plant—with a capacity of 400,000 kilowatts—meets today's needs and provides for reserve power which will stimulate further growth in this fast-expanding area. First of its two 200,000-k.w. generators—the largest in the West—began producing last year and its "twin" went into operation recently.

Working closely with Edison engineers, Bechtel designed, engineered and constructed the Huntington Beach plant—one of several important projects Edison initiated or completed in 1958 in an expansion program involving approximately $150 million.

BECHTEL CORPORATION

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problem

High-foot-candle levels from recessed fixtures were required for Pereira & Luckman's contemporary design of the new IBM Western Headquarters Building.

solution

The ARGUS LUMINAIRE was designed by Lighting Dynamics. Now in production, it is the first recessed troffer using high output and very high output lamps supplying high-footcandle levels to critical seeing areas in drafting, engineering rooms, laboratories, banks, and offices. ARGUS' clean contemporary lines produce EXCITING ARCHITECTURAL EFFECTS with long parallel strips of unbroken light. This new series comes in a WIDE VARIETY OF WIDTHS AND LENGTHS that completely integrate with ceiling materials. Easy to install. As with all Lighting Dynamic luminaires, the Argus features durable, Bonderized and electrostatic, high-reflectance finishes. FOR MORE COMPLETE INFORMATION fill out the coupon below and mail to Lighting Dynamics, 802 West Whittier Boulevard, Whittier, California; or to Lighting Dynamics, 8700 Ambassador Row, Dallas, Texas.

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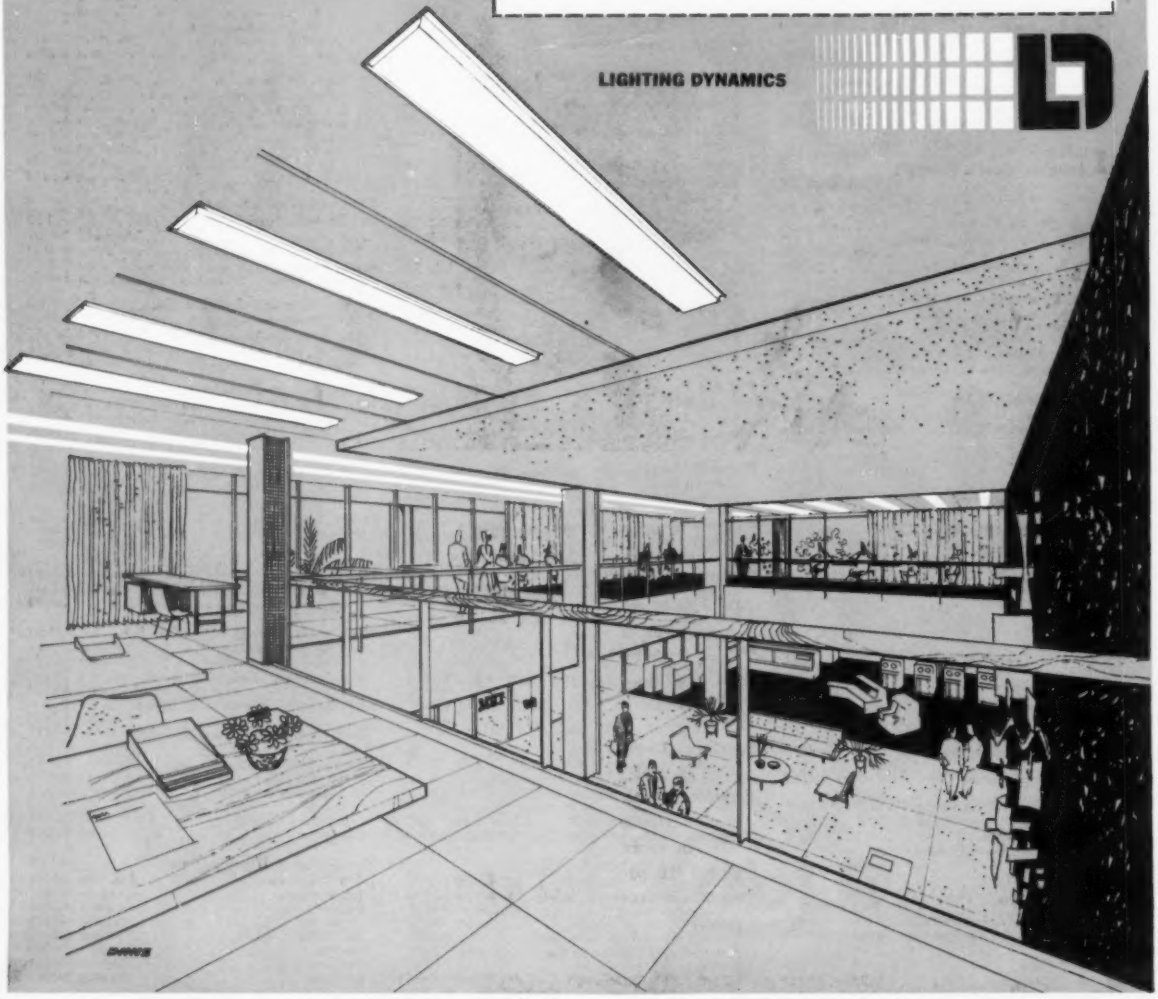

ARGUS as it will be used in the IBM Western Headquarters Building designed by Pereira & Luckman.

ANOTHER GENERAL ELECTRIC **Kilovar Plus...**

STAINLESS-STEEL Capacitors by General Electric Eliminate Repainting, Cut Maintenance Costs

W. G. HART, *Manager—Power Capacitor Sales, points out G-E capacitor corrosion-resistant feature.*

GENERAL ELECTRIC STAINLESS-STEEL CASE POWER CAPACITORS eliminate leaks caused by corrosion or rust, keeping bothersome inspections and costly maintenance to a minimum. You can use G-E capacitors to supply kilovars anywhere, regardless of atmospheric conditions. They are not affected by corrosive salt-water spray found along coast lines and resist chemical agents in industrial areas.

NO PAINT MAINTENANCE IS REQUIRED, either. This means substantial savings for you. For example, many utility engineers estimate that capacitors with ordinary case material have to be taken off the pole or out of racks for repainting at least once or twice during their service life, at a cost of $8 to $10 per repainting. Because G-E stainless-steel capacitor cases require no protective repainting, you get a direct savings in system maintenance.

THE STAINLESS-STEEL CASE is a standard feature of all G-E 25 and 50-kvar power capacitors and 3, 5, and 7.5-kvar residential secondary capacitors.

SEE FOR YOURSELF how General Electric's stainless-steel capacitors can help you cut maintenance costs. Contact your nearest General Electric Apparatus Sales Office, or write to Section 445 25, General Electric Co., Schenectady 5, N. Y.

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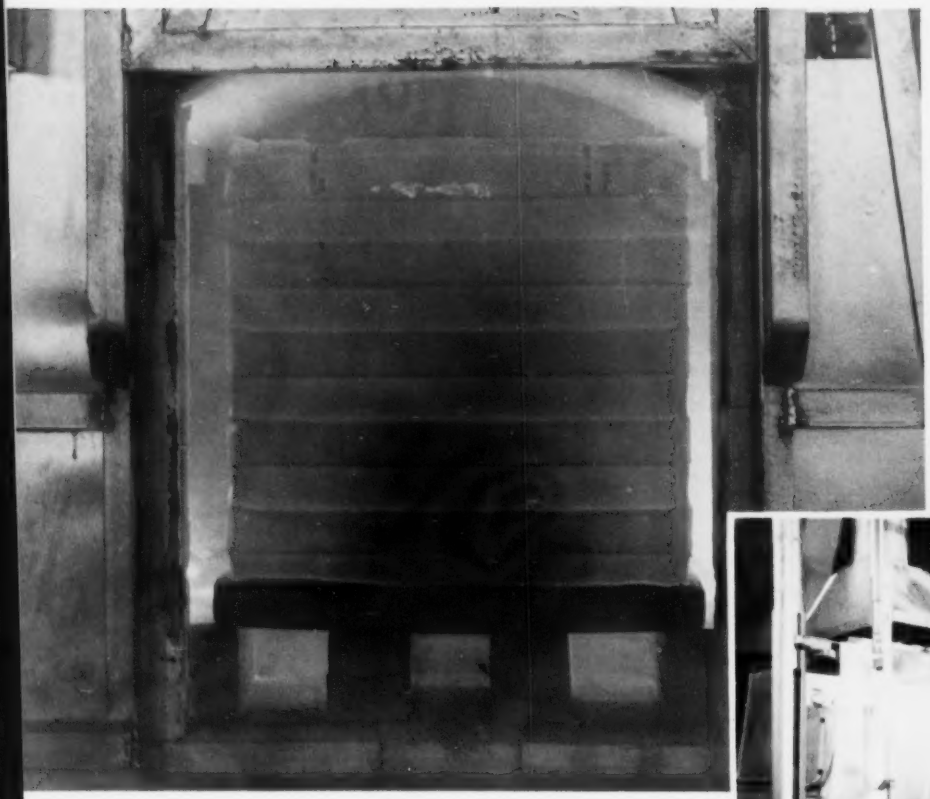
HILL...THIS WESTERN NAME has grown



PROPER ANNEALING—ONE OF THE FIRST STEPS IN THE CORE PROCESS, ONE OF THE MOST IMPORTANT IN BUILDING UNIFORMLY-DEPENDABLE TRANSFORMERS.

Still another important sign of the growing West is the complete HILL manufacturing center at San Carlos for power and distribution transformers. Here, in vastly-expanded facilities staffed by highly-trained specialists, transformers are designed, built and tested to rigid utility specifications. HILL control of every manufacturing step assures uniformly dependable, high-performance units.

Western utilities now at work meeting new demands for electrical power will find HILL's complete, fully-controlled manufacturing facilities a reliable source for transformers.

HILL TRANSFORMER CO., INC.
1030 WASHINGTON STREET SAN CARLOS, CALIFORNIA

HILL

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